The IRON AGE

Vol. 160, No. 4 July 24, 1947

THOMAS L. KANE
Publisher

o o o

R. M. GIBBS
Business Manager

o o o

B. H. HAYES
Production Manager

C. E. ELLIS
Promotion Manager

O. L. JOHNSON
Manager Market Research

o o o

CHARLES T. POST
Manager Circulation and Reader Service

o o o

Executive Offices
Chestnut and 56th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N.Y., U.S.A.

o o o

Regional Business Managers

FRED BANNISTER
W. Hartford 7, Conn.
62 La Salle Road

ROBERT F. BLAIR
Cleveland 14
1016 Guardian Bldg.

C. H. OBER
H. E. LEONARD
New York 17
100 East 42nd St.

PEIRCE LEWIS
Detroit 2
7310 Woodward Ave.

B. L. HERMAN
Philadelphia 39
Chilton Bldg.

STANLEY J. SMITH
Chicago 3
1134 Otis Bldg.

JOHN M. HUGGETT
Pittsburgh 22
814 Park Bldg.

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

o o o

Owned and Published by
CHILTON COMPANY
(Incorporated)

OFFICERS AND DIRECTORS
JOS. S. HILDRETH, *President*
EVERIT B. TERHUNE Vice-President
P. M. FAHRENDORF Vice-President
JULIAN CHASE .. ..Vice-President
THOMAS L. KANE Vice-President
G. C. BUZBY Vice-President
CHARLES J. HEALE Vice-President
WILLIAM A. BARBER, Treasurer
JOHN BLAIR MOFFETT, Secretary
T. W. LIPPERT HARRY V. DUFFY
FRED V. COLE

o o o

WILLIAM H. VALLAR, Asst. Treas.

o o o

Chilton Editorial Board
PAUL WOOTON
Washington Representative

o o o

Member, Audit Bureau of Circulation

Member, Associated Business Papers

o o o

Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price United States, its Territories and Canada $8; other Western Hemisphere Countries $15; Foreign Countries $20 per year. Single copy, 35¢. Annual Review Number, $2.00.

o o o

Cable Address, "Ironage" N. Y.

o o o

Copyright, 1947, by Chilton Company (Inc.)

Editorial

Whose Inflation? 45

o o o

Technical Articles

The Automatic Sonigage 48
New Continuous Pouring Induction Melting Furnace 55
Doorknob Production Accelerated by Ingenious Tooling 56
New Deep Hardening Carburizing Steels 62
Forging Failure Caused by Carbon Pick-Up 65
Constituents of Arcwelding Electrode Coatings 67
How to Use Carbide Cutters for Milling (Part XX) 68
New Books 70
New Equipment 71

o o o

Features

Newsfront 47
Assembly Line 76
Washington 80
West Coast 84
European Letter 88
Personals and Obituaries 92
Dear Editor 96
Industrial News Summary 98
News of Industry 101
Gallup Polls 109

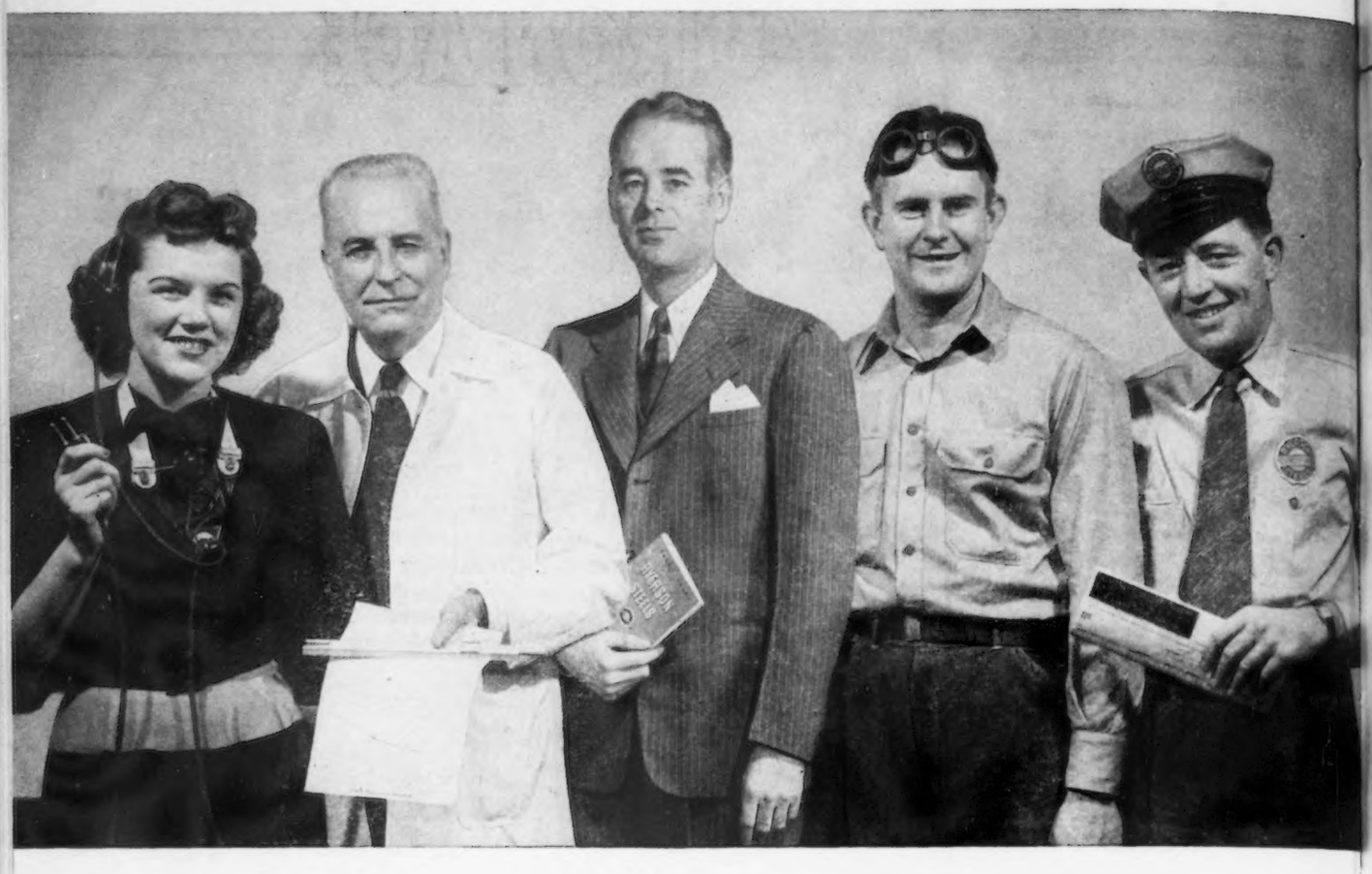
o o o

News and Markets

Cost Study Shows Reductions Needed 110
Industrial Briefs 112
Construction Steel 113
Machine Tool Developments 114
Nonferrous Market News and Prices 116-17
Iron and Steel Scrap News and Prices 118-19
Comparison of Prices by Week and Year 120
Finished and Semifinished Steel Prices 122
Alloy Steel Prices 123
Warehouse Steel and Pig Iron Prices 125
Ferroalloy Prices 126
Eagle Mt. Ore Success at Kaiser 127
France May Export Ferros This Year 128
Exports To Russia Six Times Prewar 130
Western Chrome Ores Tested 132
Iron Ore Deposits in Utah Described 134
NAM Labor Policy Criticized 141
Monsanto Develops New Insulant 144

o o o

Index to Advertisers 183-184



We're not Doing You a Favor!

In these days of critical shortages, some firms seem to consider it a favor to provide a needed product. But here at Ryerson you'll find no seller's market complex. Every inquiry is still regarded as an opportunity to serve and every order a compliment to our organization.

Prompt shipment of steel from stock is our business. When we can deliver needed steel, we're more than glad to do it. The thanks belong, not to us, but to you for letting us work with you.

That's the way we have done business for more than 104 years—through good times and bad, and that's the way we continue to operate.

Much as we'd like to handle every item on all your orders, present conditions often make this impossible. But stocks of alloys, stainless bars, seamless tubing, and many other products are in good supply at each of our twelve plants, and products or sizes out of stock today may be available tomorrow.

So contact your nearest Ryerson plant for prompt, personal service. We may not always have all the steel you need but we'll certainly do everything possible to take care of you.

Joseph T. Ryerson & Son, Inc. Steel-Service Plants at: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

RYERSON STEEL

The IRON AGE

100 E. 42ND ST., NEW YORK 17, N. Y.

ESTABLISHED 1855

o o o

July 24, 1947

o o o

THOMAS L. KANE
Publisher

o o o

T. W. LIPPERT
Directing Editor

Editorial Staff

News, Markets Editor T. C. CAMPBELL
Technical Editor.....W. A. PHAIR
Machine Tool Editor...H. E. LINSLEY
Metallurgical Editor...E. S. KOPECKI
Ass't News Editor...G. F. SULLIVAN
Art Editor .....F. J. WINTERS

o o o

Associate Editors

JACK R. HIGHT
H. W. VAN CAMP
E. L. SCHIMKO

Editorial Assistants

M. M. SCHIEN
C. R. MUNZER
J. P. O'CONNOR
R. E. BENEDETTO
A. D. STOUT, JR.
L. L. BRASS
E. K. FAISANT
D. L. WELLING

Foreign Editors

England (Contrib.)....F. H. HARLEY
49 Wellington St., Strand, London, W. C. 2, England
Canada (Contrib.)...F. SANDERSON
330 Bay St., Toronto, Canada
Paris (Contrib.).....PIERRE BENOIT
59 Rue Manin, Paris XIX, France

Regional News and Technical Editors

T. E. LLOYD
Pittsburgh 22
814 Park Bldg.

D. I. BROWN
Chicago 3
1134 Otis Bldg.

JOHN ANTHONY
Philadelphia 39
Chilton Bldg.

EUGENE J. HARDY
KARL RANNELLS
Washington 4
National Press Bldg.

W. A. LLOYD
Cleveland 14
1016 Guardian Bldg.

W. G. PATTON
Detroit 2
7310 Woodward Ave.

OSGOOD MURDOCK
ROBERT T. REINHARDT
1355 Market St., San Francisco 3

R. RAYMOND KAY
Los Angeles 28
2420 Cheremoya Ave.

Editorial Correspondents

ROBERT McINTOSH
Cincinnati

L. C. DEAN
Buffalo

G. FRAZAR
Boston

HUGH SHARP
Milwaukee

JOHN C. McCUNE
Birmingham

ROY EDMONDS
St. Louis

JAMES DOUGLAS
Seattle

Whose Inflation?

THE somewhat uneasy equilibrium between the forces of inflation and deflation seems to be a matter of cyclical concern. For months the problem enjoys only the most cursory attention—then comes a disturbance, such as the new coal wage pact, which releases a flurry of fears, solemn pronouncements and learned admonitions.

There is weighty opinion that inflation has just about run its course but some economists look for still another twist in the spiral. Still others repeatedly insist that greater and greater production is the only answer. A rather vocal group shrugs it off as merely a matter of mind, that everyone's better off and that it doesn't mean a thing: others favor laying the blame on Mr. Stalin or on exports to Europe—Mr. Truman is again pleading for holding the line—Congressmen are infuriated because Mr. Lewis declined the dose of hemlock so specially compounded for his benefit—Mr. Humphrey is hailed to the witness stand to defend his role in the coal wage "conspiracy"—Mr. Fairless takes off for Honolulu to readjust his nervous system—Mr. Lewis at one stroke of the pen climbed back from the pit to the pinnacle—the coal miner admits to no feeling of guilt, what with a new wage about equal that of a craneman in a steel mill and far less than that of a carpenter or bricklayer—and the average citizen, confused, as usual, by the kaleidoscopic events, wanly hopes that a couple of weeks at some vacation spot will impart a more tranquil perspective.

To the coal miner, his new wage is merely a long-overdue personal adjustment to existing inflation. To others, it is the lengthening shadow of further inflation. Such is the historical many-faceted aspect of inflation, which so capriciously transfers wealth from one individual to another and from one group to another. One man's inflation is another man's deflation. Each person directs the accusing finger elsewhere, and the economy rocks along with an unhealthy feverish flush.

Higher coal prices certainly will be reflected in upward adjustments in steel throughout the whole semi-durable and durable field. While this is not to be welcomed, there's no avoiding the observation that even these higher prices will fall far short of correcting the untenable unbalance that still exists between prices of durables and prices of non-durables (especially food). In terms of 1939 relationships, farm prices will still be over 50 pct higher than non-farm prices. The near future must see either farm prices come down or otherwise the steady pressure for additional upward compensatory adjustment in the prices of durables (and wages in the manufacturing industries) will be most difficult to contain.

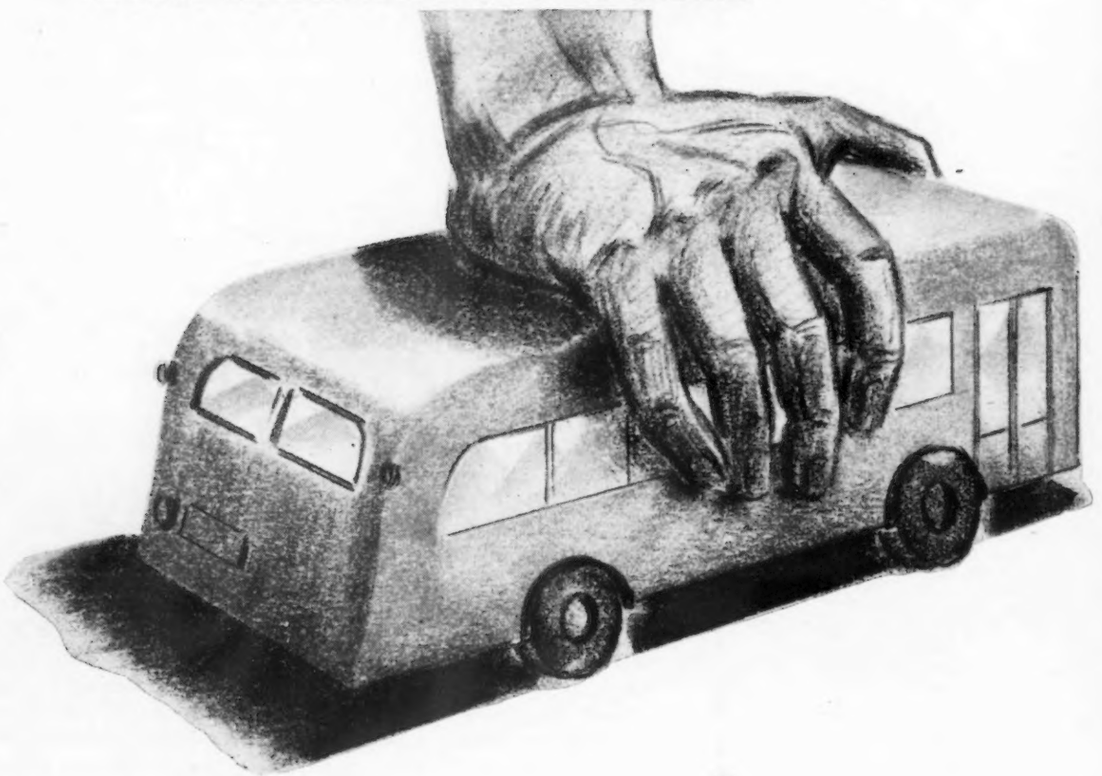
If all prices and incomes rose in the same degree the situation would excite no special apprehension. But inflation always creates painful distortions, and the persistent unbalance between prices of non-durables (and food) and durables is quite disturbing. Equally disturbing is the destruction of purchasing power of large population groups caught between the millstones. This is particularly true of those earning less than $2000 yearly and those living on endowments, fixed incomes, trusts and the like.

Just how serious this purchasing power destruction has been is indicated by the latest Federal Reserve Board survey of consumer finances. While all families showed a total increase of liquid assets in 1946 of some $8 billion, this increase was concentrated in the medium and upper-income brackets. The liquid assets of low income families (some 18,500,000 earning less than $2000 yearly) showed a decline of $10 billion. About 4,500,000 of the families expended all war-accumulated liquid assets in 1946, primarily for food and day-to-day expenses.

This disproportionate pressure on low income families hangs like a dark cloud on the economic horizon. It is this group that should weigh on the Congressman's conscience when he supports egg prices; when he pegs potato prices while thousands of tons of potatoes rot; when he piles up additional surpluses of wool and pressed for higher tariffs to keep out cheaper Australian wool.

T. W. Lippert

Eliminate "Dead Weight" on Your Mobile Equipment with INLAND HI-STEEL



WITH INLAND HI-STEEL, you can get nearly twice the yield strength of ordinary structural steel. On mobile equipment this makes it possible to eliminate considerable dead weight without sacrificing strength. Hence operation is speeded up, braking loads are reduced, and payloads are substantially increased.

Hi-Steel has other advantages, too. It has about five times the atmospheric corrosion resistance of ordinary structural steel, and is far more resistant to abrasion. It can be worked hot or cold, with little or no deviation from standard shop practice, and can be welded by conventional methods. Hi-Steel is rolled in structural sections, bars, plates, strip, and sheets. Write for Engineering Bulletin No. 11.

Hi-Steel meets the requirements of SAE Specification 950

Advantages of INLAND HI-STEEL

HIGHER STRENGTH

GREATER CORROSION RESISTANCE

MORE RESISTANT TO ABRASION

EASY TO WORK

LOW IN COST

INLAND STEEL

INLAND STEEL COMPANY
38 South Dearborn St., Chicago 3, Ill.
Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

BARS • STRUCTURALS • PLATES • SHEETS • STRIP • TIN PLATE • PILING • FLOOR PLATE • RAILS • TRACK ACCESSORIES

► Congressional pressure to increase production of farm type tubular products is expected as midwest farmers claim they are not getting their share of steel in the form of well casings and water pipe. A 30 pct increase in shipments of these products has been insufficient to meet accumulated needs.

► High speed wet grinding of either coiled or cut metal sheet and strip is being done on a machine that grinds both sides of the material at one time. Diagonal grinding possible with the machine eliminates scratches that may be elongated in further cold reduction.

► Detroit observers guess that the used car pricing situation "may eventually correct itself". The National Used Car Dealers Assn. reports that buying on lots has delined 40 pct within the last month. New York lots still advertise for clean 1947 cars for export. They claim to overbid everyone.

► Electrical equipment deliveries are improving, but fractional horsepower motors, on 18 months delivery in March, are now on a 20 months basis. Integral horsepower motors up to 15 hp are on 30-35 weeks, while those over 15 hp are quoted at about 40 weeks. About 70 to 80 pct of the full line of standard electrical controls for machinery is being sold off the shelf.

► The average automobile today is being scrapped after 12 yr and 90,000 miles, in comparison with a prewar 8.3 yr and 58,000 miles. It now takes $133 in special taxes to equip and run a new car for a year.

► Figures on steel prices show that steel increases since 1939 are less than on most other products. Steel men are having difficulties in convincing their customers, however, that with the above they are getting better steel products. The big increases on steel mill construction costs are also a source of worry.

► The U. S. Steel Corp. has never completely ignored advice from the government on questions of wages or prices within the past ten years. When going it alone without government advice, the company has adhered to a long term policy of improving its labor relations. Now with the steel price increase marking time, the corporation is making every effort to analyze the President's plea for restraint, and is making a recheck on steelmaking costs.

► Steel operations in Italy, which have been at about 60 pct of prewar, will drop considerably late this year. Italian officials expect an even more serious power crisis than was experienced last winter.

► The Turin automobile manufacturers, Fiat, are buying steel from Sweden, and are embarking on a big materials substitution program to make up for further steel deficiencies. The Italian government is directing 60 pct of domestic steel output to the reconstruction of the country.

► Carbon steel is replacing alloy steel on an increasingly large scale in parts which are subjected to torsional fatigue stress. By using induction heating methods, advantage is taken of the compressive stresses in the hardened case. The largest single applications so far have been in automotive axle shafts.

► Because of labor shortages and pressure by the newly organized unions, more cast iron pipe makers in the south are turning to centrifugal casting methods.

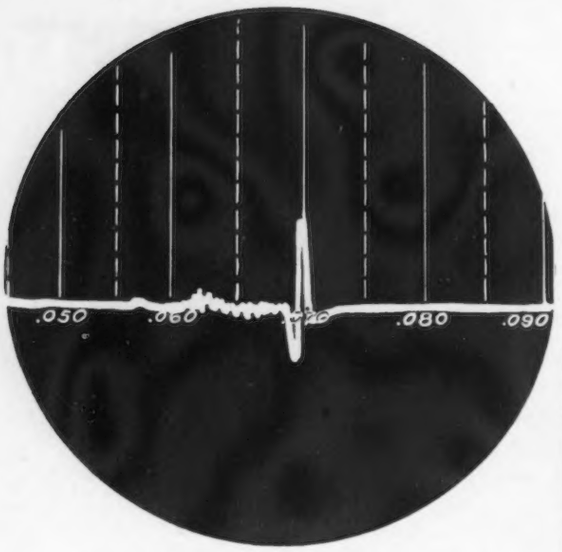
► Despite the roars of labor over the Taft-Hartley bill there is no indication of labor troubles in major industrial lines during the life of present contracts. When new ones come up for negotiation it will be found that both sides have about exhausted the old pump on higher wages-higher prices. Management has reached the end of the tether of what the public will take and labor's gains are making the old time labor boys turn over in their graves with envy.

► Reports indicate that 300,000 tons of Italian Thomas steel-making capacity that was transported to Germany during the war is to be returned to Italy. Conditions laid down by the American and British military government authorities specify that the steel plants are to be operated in Italy.

► The Dalmine Tube Co., outside Milan, has negotiated an order for pipe for the Middle East oil fields that, with a recent conversion order to supply Argentina, will fill the mill order book for the rest of this year.

► A flying chef is the newest wrinkle in Atlantic flying, announced by the Dutch airline. This service should beat the cold scrambled eggs and bacon that at least one American company is serving.

The Automatic S



AN indication on the Sonigage for steel 0.070 in. thick.

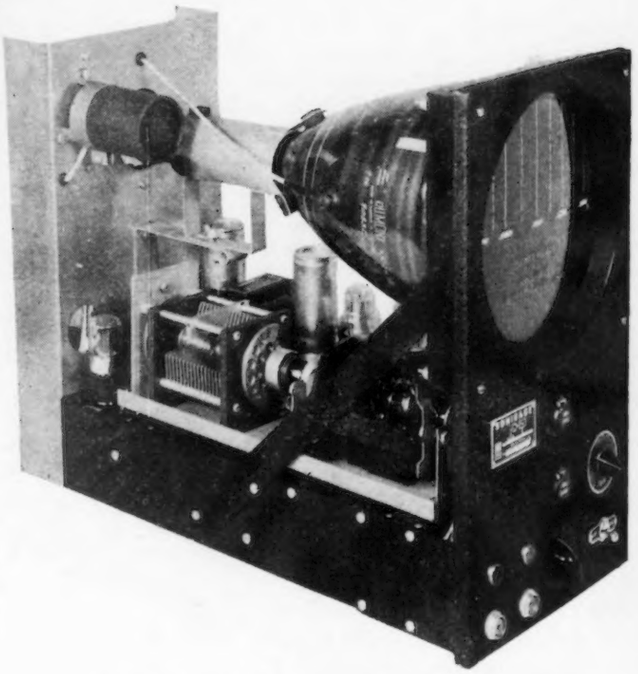


FIG. 1—View of the elements of the automatic Sonigage. All elements of the gage except crystal and cable are built into one cabinet.

THE ability to obtain certain physical information on metal parts is frequently limited by accessibility. Instances of this type are the measurement of wall thickness in long tubes and the detection of internal flaws in heavy pieces of steel. Application of long calipers to the first of these problems is limited by the lack of rigidity of the calipers and the resulting inaccuracies in the measurements. X-ray methods may be applied to the second problem if gross flaws are present, but fail to show thin voids and cracks in heavy structures. The Sonigage provides a new, nondestructive method for these and many other inspection problems. This article describes the new automatic model of the Sonigage, shown in figs. 1 and 2, and discusses its applications. An earlier model, originally developed for measuring the wall thickness of hollow steel propeller blades, has been previously described.[1] The instruments are similar in principle, both using ultrasonic waves, but the new instrument has the advantages of greater sensitivity, convenience and speed, with the result that the field of usefulness of the Sonigage has been greatly expanded.

[1] THE IRON AGE, *Nov. 9, 1944, p. 59.*

The Sonigage employs a simple electronic oscillator to generate electrical voltage, the frequency of which is varied throughout the tuning range of the oscillator. Means are provided to indicate the point or points in this tuning range at which the part resonates. Inasmuch as resonant-frequency and thickness of the part are related in a simple manner for any given material, it is possible to calibrate the Sonigage to read thickness directly. The resonance indications may also give information on the soundness of the part, as will be explained later.

In the original type of instrument,[1] the operator tuned the oscillator by hand and watched the meter for a sharp increase in current, which indicated that resonant vibrations were set up in the part. The thickness is then read directly from the calibration on the tuning dial. This type of Sonigage gives a thickness reading in a few seconds and is very useful for spot checking. In many cases, however, it is important to inspect sizable areas, and a more rapid method is required. The automatic Sonigage was developed to meet this requirement.

In the automatic type, the tuning condenser in the oscillator is rotated continuously by a small electric motor. The operator watches the screen of a cathode-ray oscillograph for indications of resonance of the part. These indications appear as sharp vertical deflections of the trace, such as shown in figs. 2, 6, 7, etc. The position of these indications along the horizontal axis is determined by resonant frequencies of the part and is thus related to thickness. The superimposed calibration scale reads thickness of the part directly if its thickness is within the range of the instrument.

The automatic Sonigage is built in one small steel case and weighs 40 lb. The components

Sonigage . . .

—A new ultrasonic testing instrument

By WESLEY S. ERWIN
and
GERALD M. RASSWEILER
Research Laboratories Div., General Motors Corp., Detroit

The automatic Sonigage, a simple ultrasonic device that makes possible rapid non-destructive tests of many metal and plastic parts, is described in this article. A feature of this new instrument is that only one surface need be available to measure thickness, with less than 2 pct error. Thickness of tubes, as well as flat parts, between 0.005 and 0.250 in. may be read directly, and up to several inches may be read indirectly. Solid parts may be inspected for freedom from flawed regions and for some types of defective bond not readily located by other methods.

previously mentioned are arranged in the Sonigage as shown in fig. 1. In the lower part of the cabinet is the variable-frequency oscillator with its motor-driven condenser and an electronic power supply operating from 110 v ac. The upper part of the cabinet houses the cathode-ray tube. The quartz crystal is mounted in the holder at the end of the cable leading from the oscillator, as shown in fig. 2.

The rotation of the tuning condenser continuously sweeps the frequency of the oscillator through its tuning range. Simultaneously the cathode-ray spot is swept horizontally across the screen, once for every revolution of the condenser. This motion across the cathode-ray screen is synchronized with the condenser rotation, so that points along the horizontal axis of the screen correspond to frequencies being applied by the quartz crystal to the part under test. If the part has resonant frequencies within the tuning range there are, at these frequencies, momentary increases in the energy supplied to the crystal. Each energy increase is indicated by a vertical deflection of the cathode-ray spot. The resonant frequencies of the part being tested are, therefore, denoted by the positions of vertical peaks along the horizontal trace.

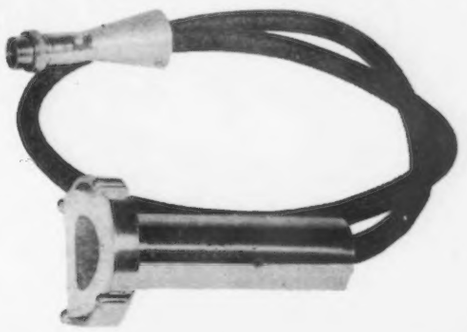
A tuning range cannot conveniently be built to cover more than one octave, or a 2 to 1 interval; such a span is not sufficiently broad to handle a wide variety of work. Additional ranges may be incorporated in one instrument by switching different inductance coils into the oscillating circuit. The model shown in fig. 2 has two ranges and the

LEFT

FIG. 2—In measuring thin sections, the crystal is pressed into oiled contact with the piece and the thickness is read directly from the screen, as shown in this example of the measuring of a 0.060-in. wall of a hollow steel propellor blade.

BELOW

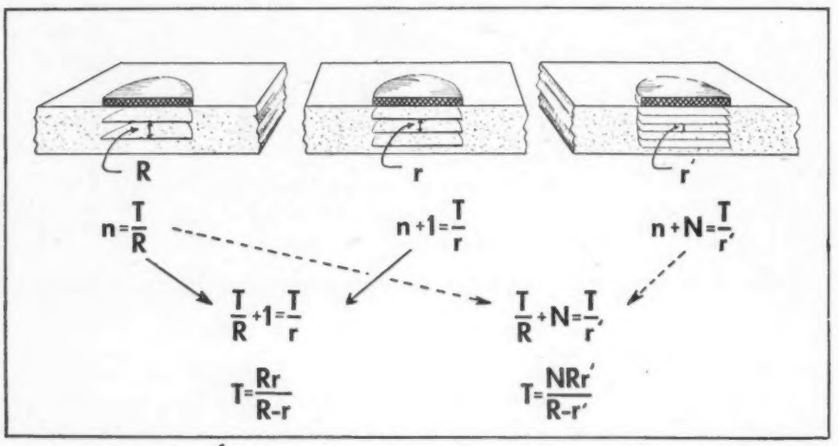
FIG. 3—A crystal curved to match the surface, as shown here, increases the sensitivity of the gage.



switch for changing from one to the other can be seen on the front panel. A different crystal should be used with each range, so two cable outlets are provided.

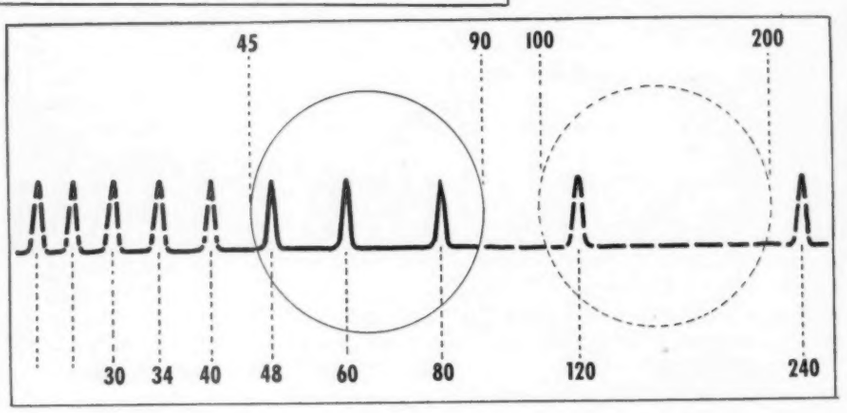
For each range a different calibration scale is required in front of the cathode-ray screen. To facilitate changing, the scales are printed on transparent sheets which are inserted in a slide provided in the front of the cabinet. The scales, pilot-lights, and crystal supports, are color-coded to avoid confusion when changing ranges.

The only controls on the front panel are the on-off switch, the range switch, and the gain control. The latter is used to change the height of the vertical indications, depending on the nature of the work. Change in vertical gain has no influence on the horizontal positions of the peaks or the corresponding thickness readings. Occasional checks on calibration should be made, and means are provided on the front panel for screwdriver adjustment of trace position and width. To make a measurement, the operator presses the quartz crystal in the holder against the piece being tested. The piece should be oiled to provide good ultrasonic contact between crystal and work.



ABOVE

FIG. 4—Longitudinal harmonic vibration may be pictured as the vibration of a number of sheets of equal thickness. Values of R and r, or R, r', and N are taken from the Sonigage screen. Thickness T can be calculated from the equations shown.



RIGHT

FIG. 5—In the solid circle are shown the harmonic peaks appearing on a Sonigage screen with 0.240 in. steel. A more complete harmonic spectrum is shown for comparison.

Thin Section Measurement

The crystal of the Sonigage, when pressed against a piece, may induce either fundamental or harmonic modes, of longitudinal vibration, depending on the relation between the applied frequencies and the resonant frequencies of the piece. When a piece is vibrating in its fundamental longitudinal thickness mode, the opposite surfaces are moving first toward and then away from each other. The intervening metal is alternately subjected to compression and tension. In the fundamental mode one, and only one, nodal plane in the interior remains at rest and undergoes maximum changes in stress. It is important to point out, in passing, that this vibration is limited to a portion of the piece directly under the crystal so that all observations made with the Sonigage refer to this portion of the piece.

Thicker plates have lower frequencies of fundamental-mode longitudinal vibration. For steel, the expression of this relation is $T \times F = 121{,}000$, where T is the thickness in inches and F is the frequency in cycles per second. Where it is feasible to use the fundamental mode, it is desirable to take advantage of this simple relationship which allows a direct reading of thickness from the oscillograph screen. But there is a practical upper limit to the thickness which can be handled in this manner with the Sonigage. For one thing, the diameter of the crystal as well as its thickness must be increased for thicker sections. The fundamental mode has been successfully used on steel from 0.005 to 0.5 in. thick, but under less favorable conditions the practical upper limit is 0.25 in. Above 0.25 in. it is desirable to use harmonic modes, as will be described later.

Tubing 0.5 in. diam or larger may be measured. Fig. 2 shows the Sonigage measuring a 0.060-in. wall of a hollow steel propeller blade. The thickness of large tanks can be measured except where corrosion has made the surfaces very irregular. Drawn and spun metal parts may also be checked even if spherical. By sliding the crystal over a part the thickness profile can be observed, abrupt changes in thickness can readily be detected, and the inspector can determine whether or not the part is within thickness specifications by observing whether the Sonigage indication stays inside of limits marked on the calibration

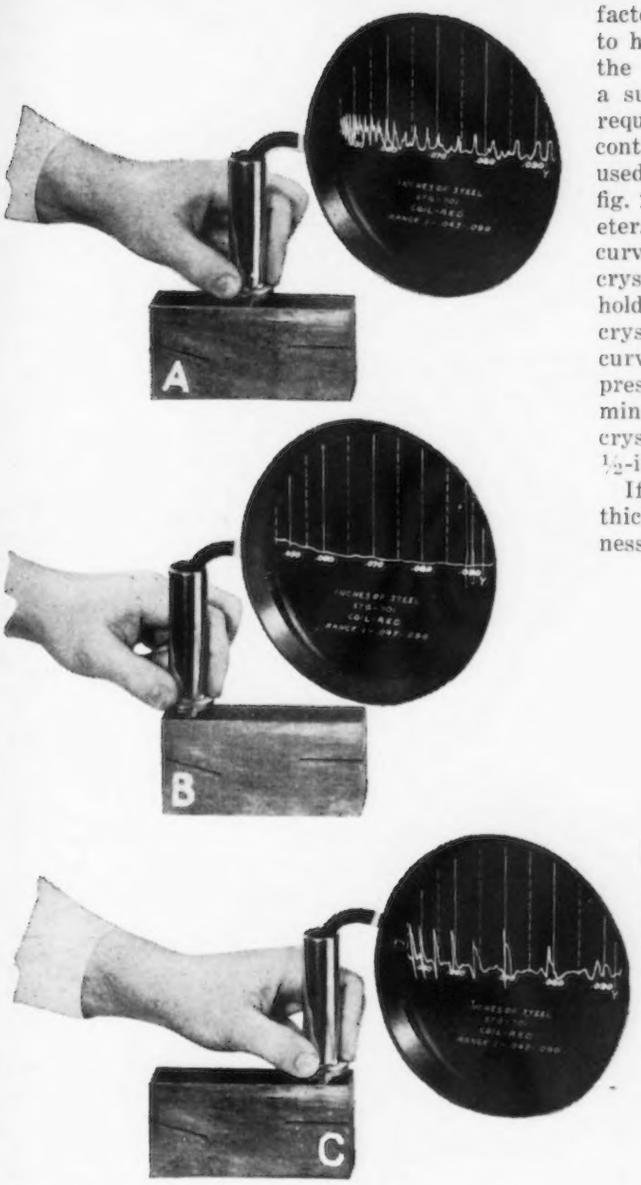


FIG. 6—If the portion under the crystal is sound, the indication corresponding to total thickness is obtained, as shown at *A*. (Black lines in block are sawcuts.) If the flaw is not parallel to the surface, no thickness indications appear on the screen, as shown at *B*. If the flaw is parallel to the contact surface a thickness reading is obtained, as shown at *C*, characteristic of the depth to the flaw.

screen. Thickness measurements can be made with the Sonigage with errors seldom exceeding ± 2 pct in production inspection.

It may be stated in general that if a thickness indication can be observed at all with the Sonigage, the reading will be correct. However, there are conditions which reduce the height of the indications on the oscillograph screen to such an extent that they may be difficult or impossible to read.

An important factor in controlling height of indication, or sensitivity, is contact area between crystal and work. This area must be great enough to allow adequate transfer of ultrasonic energy. Surface roughness is one factor which reduces effective contact area and sensitivity. Ordinary machined or rolled surfaces are satisfactory, but sand-cast surfaces are too rough to handle without smoothing at the spot where the measurement is to be made. In general, a surface smoothness of 0.001 in. or better is required. Curvature of the part also reduces contact area and sensitivity. Flat crystals can be used on some curved surfaces, such as shown in fig. 2. However, when working with small diameters it is desirable to use crystals which are curved to fit the part. Fig. 3 shows a 1-in. crystal curved to fit the part and mounted in a holder designed to assure proper orientation of crystal and work. Crystals for both flat and curved work are constructed so that the crystal pressure is fixed by an internal spring, thus minimizing wear and breakage. The size of the crystal also affects the contact area. Generally, ½-in. or 1-in. wide crystals have been used.

If the section under the crystal varies in thickness, due to such factors as taper or roughness of the surface opposite the contact area,

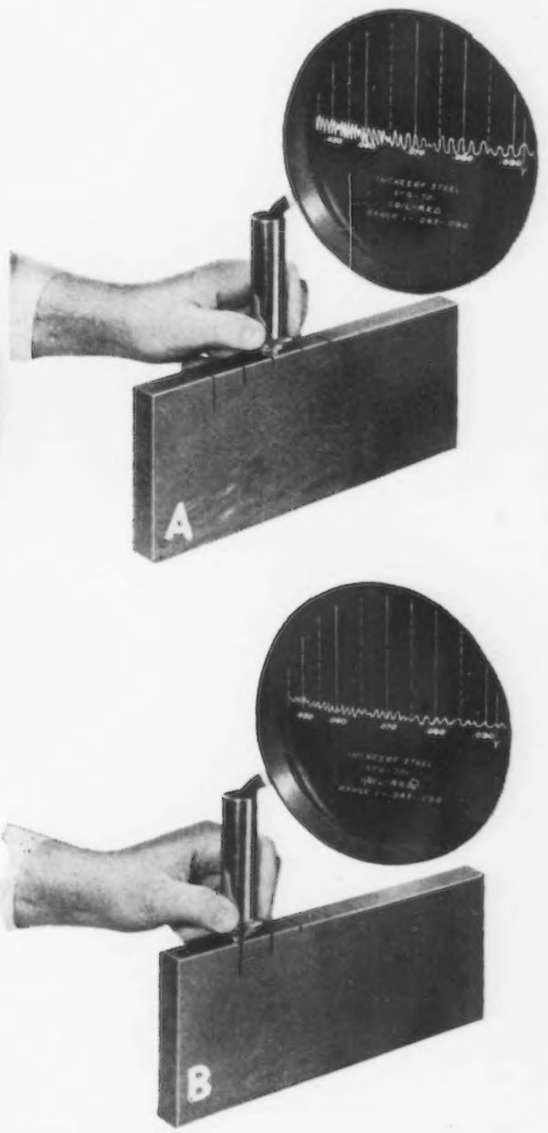


FIG. 7—When a small flaw lies perpendicular to the surface so that its projected area on the crystal is negligible or small, the effect on the resonance indications is likewise small, as shown at *A*. When a perpendicular crack is deeper than about 0.5 in. it may be found by the reduction in amplitude of the resonance indications, as indicated in illustration *B*.

then the resonance peaks will be smaller and broader. With a thickness taper of more than about 10 pct per surface inch, the peaks are not easily identified. Paint and scale on the surface also reduce the sensitivity.

Testing Various Materials

A wide variety of metals may be tested with the Sonigage, including steel, brass, nickel, copper, silver, aluminum, magnesium and, surprisingly enough, lead. Each metal requires a different calibration of the instrument because the resonant frequency is determined by elastic properties and density as well as by thickness. Each alloy of brass requires a separate thickness calibration; conversely, rough estimates of composition might be made on samples of known thickness by observing shifts in the positions of resonance peaks.

Fortunately, the modulus and density of steel do not vary appreciably with ordinary alloy content, heat treatment, or hot or cold working. Therefore, one gage calibration suffices for steel except for stainless or other high alloys.

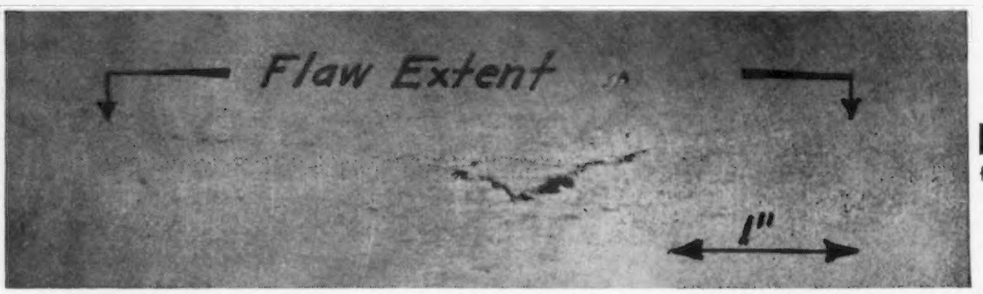
In addition to metals, the Sonigage may be applied to some other materials such as glass, bakelite (unfilled), lucite, celluloid and some rubbers. Thickness indications can even be secured through thin sections of human flesh such as the hand. Since these materials do not conduct electricity, a thin conducting plate may be attached to the outer surface of the crystal and connected to the cable sheath to apply voltage across the crystal. When metals are being tested, the work acts as one electrode and the circuit is completed by contact of the crystal holder and work.

The sensitivity is greatly reduced in some cast irons by internal damping. This effect, combined with the roughness and taper usually encountered in cast structures, greatly restricts the utility of the gage in this field. However, recent improvements in Sonigage sensitivity make it appear probable that some applications to machined cast iron, such as measurement of cylinder wall thickness, may be practical with curved crystals.

Thick Section Measurement

On parts thicker than about 0.25 in., the fundamental mode cannot be easily used except on very smooth flat sections. For thicker sections it is more practical to use harmonic modes of vibration. Pieces up to several inches thick can be measured by this method.

The nature of harmonic modes can be visualized by imagining the sample to be composed of any whole number of sheets of equal thickness, as shown in fig. 4. Each of these sheets may be pictured as vibrating in the thickness direction, as described previously, and transferring vibration to the next sheet. For instance, a sample 0.24 in. thick can vibrate as one sheet (fundamental mode), as two 0.12-in. sheets (second harmonic mode), three 0.08-in. sheets (third harmonic), four 0.06-in. sheets (fourth harmonic), five 0.048-in. sheets (fifth harmonic), and so forth.



LEFT

FIG. 8 — This thin flaw in a large forging was located with the Sonigage.

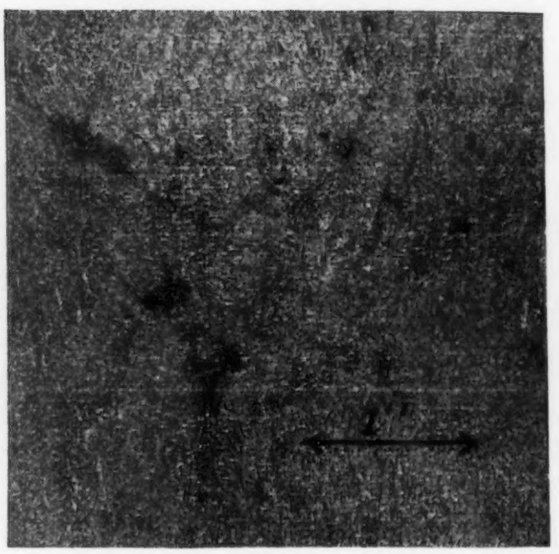


FIG. 9—Porosity of the type shown here was located with the Sonigage in billets being used for forgings, such as in fig. 8.

If the Sonigage could be swept through a frequency range large enough to include frequencies which are characteristic of all these individual sheet thicknesses, the indications on the screen would look somewhat as shown in fig. 5. But a typical Sonigage range might be from 0.045 to 0.090 in. When this Sonigage is applied to a sample 0.240 in. thick, three resonance peaks appear at the 0.080, 0.060, and 0.048 in positions, as indicated in the solid circle in fig. 5. There is only one total thickness of the sample which could result in three adjacent peaks at these positions, and in the next section it will be shown how this actual thickness can be determined from the harmonic readings if two or more are visible on the screen.

It should be noted that if only one peak appears on the screen, it may be either a fundamental or second harmonic. For example, in fig. 5 if the range were 0.100 to 0.200, as shown by the dotted circle, the second harmonic at 0.200 would appear alone. However, no higher harmonic can appear alone if the frequency range is 2 to 1 or larger. In most cases where only one peak appears, the operator will have sufficient knowledge of the part to choose between two values differing by as much as 0.120 and 0.240. In case of doubt, an observation in another thickness range should be made.

Typical Sonigage measurements by the harmonic method include wall thickness of heavy pipe, tapered tubing, steelcastings, and forgings. Eccentricity of bore in certain heavy machined parts may be checked readily.

Harmonic Calculation

Assume that the actual thickness of the part is not known and that adjacent peaks are observed at 0.060 and 0.080 as shown in fig. 5. The actual thickness may be calculated by dividing the product of the two readings by their difference:

$$T = \frac{0.080 \times 0.060}{0.080 - 0.060} = 0.240$$

The statement of the general relation is:

$$T = \frac{Rr}{R\text{-}r}$$

where T is the actual thickness, R is the thicker reading and r is the adjacent thinner reading on the Sonigage. The derivation of this formula is shown in fig. 4.

On very thick sections the harmonic peaks appear so close together that it is difficult to get an accurate difference in the denominator if readings are taken on adjacent peaks. Better accuracy may be attained in these cases by reading harmonic peaks which are more widely separated. As shown in fig. 4, the required revision of the formula for thickness is

$$T = \frac{NRr'}{R\text{-}r'}$$

where N is the number of spaces between the peaks corresponding to readings R and r'. The determination of thickness may also be carried out by graphical or trial methods if desired.

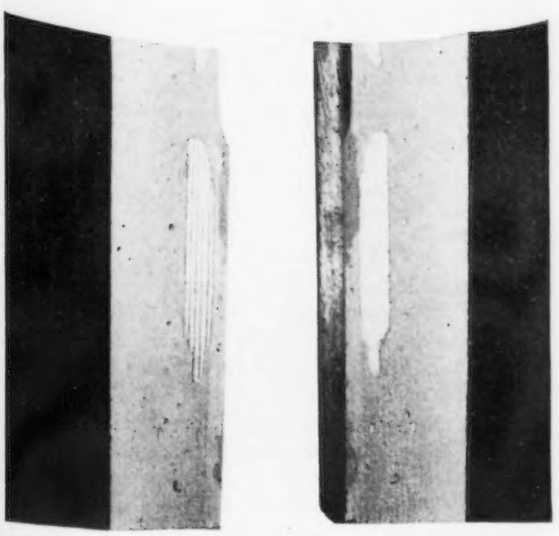


FIG. 10—This void in copper brazing was located by inspection on the outer surface of one of the sheets.

Flaw Detection Methods

The Sonigage has a wide field of usefulness in the detection of internal flaws. Two methods may be used in this work. They are even simpler than thickness measurement, since only presence or absence of thickness indications need be observed. The first method depends on an observation of whether or not an expected indication of thickness is obtained from the part. It may be used on pieces having two opposite sides which are smooth and parallel, such as plates, sheets, tubes, blocks, or bars with squared ends. It may also be used on cylinders from ½ to 36 in. diam and on spheres. The reason that cylindrical and spherical parts can be vibrated is that each element of crystal contact area has an opposite parallel element of area. The thickness between all such parallel elements is equal to the diameter. If, when the gage is pressed into oiled contact with one of these surfaces, the resonance indications corresponding to thickness are obtained, then the section under the crystal is ultrasonically sound. This means that it has no voids, cavities, or porosity covering any appreciable portion of the area under the crystal. If, however, there are flaws under the crystal and these flaws are not parallel to the surface, all the thickness indications will be greatly reduced or will disappear altogether. The first method for flaw inspection thus consists of sliding the crystal over the work and watching for significant changes in height of the resonance peaks.

Figs. 6(A) and 6(B) illustrates the operation of method one. In fig. 6(A) the crystal is over a sound section of a steel block and a large number of harmonic peaks characteristic of the thickness of the part are visible on the screen. When the operator slides the crystal to the position shown in fig. 6(B) over a nonparallel saw cut, which represents the general type of flaw, the thickness indications on the screen disappear.

The saw cut in fig. 6(B) is much thicker and wider than would be necessary to give the observed effect. Even very thin flaws such as laminations are readily detected. The Sonigage output is less than a watt and at the frequencies employed, the amplitude of vibration induced in the part is on the order of one billionth of an inch. As a result, the vibrations are not passed across even very narrow gaps such as exist between two gage blocks pressed together with no oil between them.

Fig. 7 illustrates a special case where the flaw is perpendicular to the contact surface. If such

a flaw is small, thin, and strictly perpendicular to the contact surface, as in fig. 7(A), the effect on the thickness indications will be small. But, strangely enough, if the depth of the flaw is comparable to or greater than the diameter of the crystal, an appreciable decrease in resonance indications may be obtained, as shown in fig. 7(B). Although it is generally possible to locate large flaws which are perpendicular to the surface, it is better to inspect the piece from other directions in order to present the maximum projected area of the flaw toward the crystal. Method one is recommended and should be used wherever possible since it proves soundness, neglecting only flaws small compared to the crystal size. However, it gives no information as to their depth below the crystal.

FIG. 11—Voids in rubber-to-metal bond such as shown here may be located with the Sonigage.

The second method for flaw detection does not prove soundness but may locate and give information on the depth to the flaw. It can only be applied in special cases where the flaw is flat and parallel to the crystal contact surface. In this case the metal between the flaw and crystal may vibrate at its own resonant frequencies. Thus the resonance peaks do not appear at the positions expected for the total thickness of the part, and the presence of a flaw is indicated. The depth to the flaw below the crystal contact surface may be determined from the Sonigage readings. The effect just described is illustrated in fig. 6(A) and 6(C). When the operator slides the crystal from the solid portion shown in fig. 6(A) to the location over the simulated parallel flaw as in fig. 6(C), the appearance of the harmonic pattern on the screen changes. The new peaks are farther apart in fig. 6(C), as would be expected because of the smaller thickness which is set into resonance.

This second method has some utility on parts which do not have an opposite parallel surface, in which case no thickness indications are observed unless a parallel flaw is found. It should be emphasized that in this case a nonparallel flaw will not be detected. Since flaws in general are not parallel to the contact surface, negative results for this inspection do not guarantee freedom from flaws.

Typical examples of flaw inspection by means of the automatic Sonigage are laminations in sheets, plates, and clad metals, porosity in tool-steel bits, shrinkage cavities and porosity in ingots, billets and forgings, and cracks due to forging or rolling. Even intergranular cracks and some carbides are detectable. The thickness of the part under inspection may be as little as 0.005 in. In some cases it may be as thick as 3 ft.

A flawed region found with the Sonigage is shown in fig. 8. The illustration shows a section through a 6-in. diam flawed area in a large forging. Some of the flaw is so thin that it is not readily visible. By testing a part of this type between each of the stages of fabrication it was possible to prove that cavities were present in the original ingot and were flattened but not welded by the forging process.

During this study, flaws were located with the Sonigage in an 8 x 8 in. billet. The depth of the flaw was not known, but metal was cut away with a shaper until the unsound area was reached. It proved to be a region of porosity as shown in fig. 9 with rather small single flaws which would not have been detected separately but which were numerous enough to completely eradicate the resonance pattern characteristic of the piece.

The same limitations that apply to the Sonigage when measuring thickness, such as roughness and curvature, still apply for flaw inspection. Flaws are not readily detected in ordinary cast iron because of its high damping.

Some so-called laminations in steel which show up by deep etching, test ultrasonically sound and prove to be only areas of segregation which etch more rapidly than the surrounding metal.

Inspection of Bond

In addition to testing solid parts for thickness and flaws, the Sonigage may be applied to testing certain types of bond. In general it may be stated that in order to detect a faulty bond with the Sonigage there must be a void, that is, an area of actual separation of the bonded materials. This separation may be extremely small, as indicated previously.

Bond testing applications may be divided into four types. The first type employs the technique described earlier as method one for flaw detection and may be applied, for example, to arc-

welded joints. The second type employs the technique described as method two for flaw detection. It may be applied to parts where any unbonded surface would be parallel to the crystal contact surface. The crystal is slid over the bond and the observer looks for resonance which is characteristic of the thickness of the portion between the crystal and the bond.

One typical application of this type is the inspection of a metal sheet copper-brazed to another member, as around the edges and over the rib of the propeller blade shown in fig. 2. Another typical application is the examination of bond between a silver bearing pad and the backing to which it has been attached by a soldering operation. But welds in bars may be inspected from the squared ends. Fig. 10 shows a typical void in the copper brazing between two sheets. The void has been exposed by breaking the sheets apart after locating it with the Sonigage.

The third method of testing is useful on bonds such as between sheet metal and rubber. The free surface of the metal is explored with the crystal. In most cases where there is good bond between the metal and rubber, the Sonigage indications are absent or small because of the damping of the rubber on the opposite surface. But where a void exists in the bond, the thickness indications of the metal sheet reappear with normal undamped vertical amplitude. In fig. 11 the rubber has been stripped back from a metal sheet to expose a void located with the Sonigage.

The fourth type of bond testing applies to some cases in which there is a thin layer of low damping cement between two sheets of metal. In these cases resonant frequencies may appear which do not correspond to either sheet or to their combined thickness, but to a complex mode of vibration which, nonetheless, indicates good bond.

As yet no way has been found to distinguish between good and poor adhesion with the Sonigage. For example, one very common type of bond which cannot as yet be successfully tested is electroplate adhesion. Apparently the electroplate can be close enough to the base metal to transmit ultrasonic vibrations and still have only poor adhesion under larger stresses. Some rubber-to-steel bonds also have intimate enough contact to transmit the Sonigage vibrations, and still have poor adhesion.

Carburized case depths and the thickness of layers of babbit and silver plate on steel are not measurable directly because the layers cannot be vibrated separately if they are bonded.

Acknowledgment

The authors express their appreciation to Dr. E. J. Martin, head of the Physics Instrumentation Department, for directing this development, and to C. E. Quinn for his contributions in mechanical design and construction of the Sonigages.

New Continuous Pouring Induction Melting Furnace

A TWO-CHAMBER unit of completely new design that permits continuous pouring—the Lindberg-Fisher induction melting furnace for aluminum, brass and zinc — has been announced by Fisher Furnace, Div. of Lindberg Engineering Co., Chicago. The two chambers, one of which is for charging and the other for pouring, are connected by a series of straight line melting channels, see fig. 1.

It is claimed that the metal in the pouring chamber is always at pouring temperature, and that adding cold metal to the charging chamber does not affect temperature in the pouring chamber, within reasonable operating limits. Only clean, residue-free metal is said to reach the pouring chamber since all residue either floats at the surface or sinks to the bottom of the charging chamber. The straight line melting channels permit cleaning by means of a simple cleaning rod.

Both furnace chambers are refractory lined and do not require crucibles or pots. Operation is held to be cooler since the induction heating heats the metal only, and not the entire furnace, and heat loss is minimized by the use of covers on the chambers.

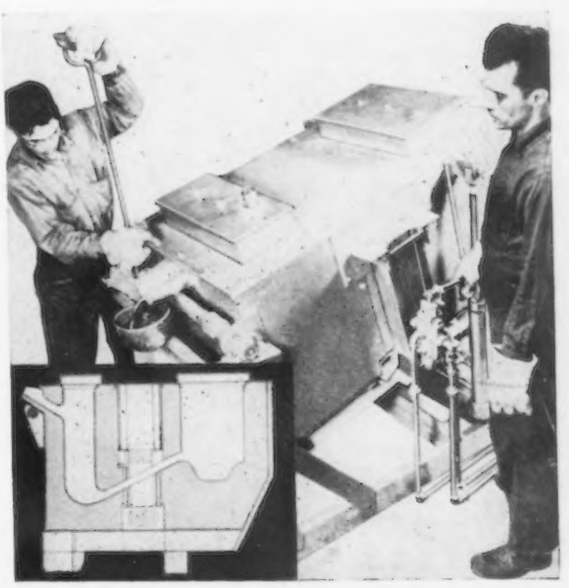


FIG. 1—Photo illustrates the Lindberg-Fisher two-chamber electric induction melting furnace in operation. Schematic sketch of cross-section of the furnace unit is shown in the insert.

Doorknob Pr

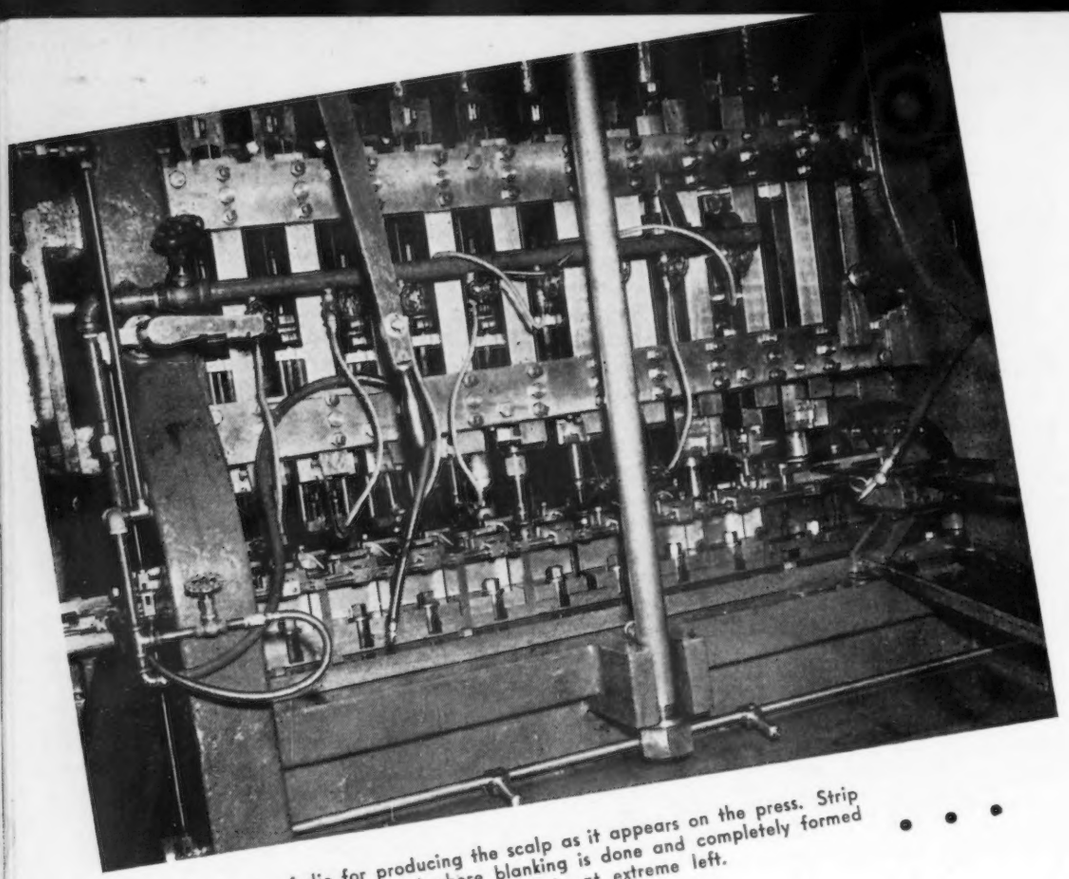


FIG. 1—Close-up of die for producing the scalp as it appears on the press. Strip stock feeds across the right end where blanking is done and completely formed parts are dropped into the chute at extreme left.

MANUFACTURE of door hardware involves many seemingly prosaic items, but the very fact that they are sold in large volume in a highly competitive market makes it essential that high economy be attained in manufacture if reasonable profit is to result. It is not surprising, therefore, that Yale & Towne Mfg. Co., a leader in this field, has done an outstanding job in tooling to attain desired results with a new setup for doorknob production.

All-metal knobs, produced (for the line here considered) in both brass and steel, are normally made largely from stamped components where minimum cost is an objective. This is the method chosen in this case. The assembly does include, however, a small diecast zinc alloy insert, because this is the most economical as well as a very satisfactory way to provide a secure square hole attachment for the spindle.

There are only two stamped components in the knob, but the way they are produced and assembled at high speed and with high precision is noteworthy. Of the two parts, that known as the scalp, which constitutes the shank of the knob, is the more interesting and the more difficult to make. It is turned out complete and ready for assembly in a single nine-station progressive die, shown in figs. 1 and 2.

This die is installed in a new Waterbury-Farrel multiplunger press made especially for this job. Although the die operates progressively, it is, in reality, a series of nine separate dies, each of which can be removed and replaced easily and quickly when occasion requires.

Transfer of the work from station to station is accomplished by fingers actuated by a frame, the side rails of which are moved transversely by crankpins at the four corners and are given longitudinal motion by a cam on a vertical shaft at one end of the press, as with many other presses of the same general design.

With this arrangement strip stock is fed transversely through straightening rolls and the blank is cut from the stock at the first blanking station. The flash is not depended upon for indexing but is immediately fed off onto a reel. As the blank is circular, it is readily centered for the first forming operation and thereafter is automatically centered by the die recesses and punches that perform the successive operation. A good indication of the way in which the die is constructed and functions is given by the vertical longitudinal section of the die in the drawing in fig. 3. Fig. 4 shows the shape of the piece as it appears after each successive operation, as finished and, finally, as assembled.

Blanking is done at the first station, fig. 3. The blank drops through the die and is advanced by pusher A until it comes to rest under spring clip B from which the blank is advanced by the first pair of shifter fingers to the second station where there is a double acting ram.

At station 2, the blank holder or pressure ring C is moved by one action and the punch by the second action. The punch and die form

Production Accelerated By Ingenious Tooling

By HERBERT CHASE

To obtain high production at low manufacturing cost while maintaining traditional quality standards, Yale & Towne Mfg. Co. has devised some ingenious tooling for the forming and assembly of door hardware. Described herein are some of the new setups, including a nine-station progressive die for drawing and forming the lower section of a doorknob, an assembly die and several high output drills and presses.

a cup with a flared lip which is pushed out by a pin and advanced to station 3 by a pair of fingers. At this station, a second diameter is drawn, and it is made deeper and the flange is flattened at the fourth station.

Flash is sheared from the flange at station 5 and the ring of flash feeds up the punch until cut in half by two cutters D. An air blast blows the flash into a chute seen at the center of fig. 2. After this, fingers shift the trimmed cup to station 6, where the draw is made deeper, the bottom of the cup is formed to another step, and the flange is drawn to form a short tubular section at the top.

At station 7, a square punch pierces a hole in the center of the bottom of the cup and another portion of the punch forms the lip inwardly to produce a bevel. Slugs drop through the pierced die into the hollow knockout and fall out through a side hole. During this operation, the work is centered by a sleeve surrounding the punch.

A crimping operation is performed at station 8 while the piece is held between the punch and the die and is struck by the stripper E which forms a ledge where it is forced against the bevel produced in the prior operation. This leaves a short tubular section above the ledge, the end of which is in contact with a tubular spring-actuated shedder F that pushes the piece off the punch.

At the ninth station, the piece is given its final sizing between the punch and the die and the stripper G, which has a beveled end which spreads or curls the short tubular portion at the upper end so that an annular groove is left between the resulting narrow flange and the ledge. After this final forming, a mechanical knockout lifts the finished piece, it is gripped by the final set of transfer fingers and is dropped into a chute seen at the extreme left in fig. 1. The groove produced in this operation is the one into which the top portion of the knob is forced as described later.

Although a square hole is pierced in the bottom of the scalp at the seventh station of the progressive die to fit the square spindle, this has to be supplemented by the insert which is

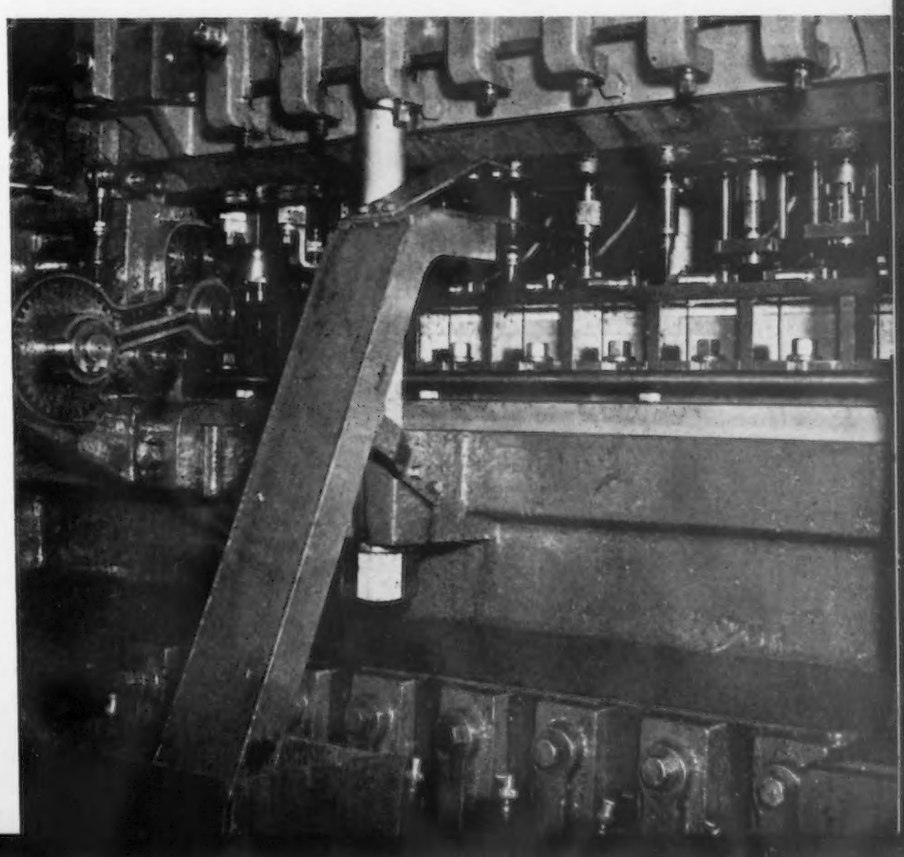


FIG. 2—Scalp die as seen from side opposite to that shown in fig. 1. Feed rolls are at left and scrap chute for flash trimmed at station 5 is at center.

diecast with a square cored hole having a key-like projection for locating purposes at one side. Application of this zinc alloy insert is done in a press equipped with a dial having 16 stations as shown in fig. 5.

Loading of the dial is done by hand and correct angular relation of the the two parts is insured by placing them over slotted square pins that fit the corresponding hole and the key-like projection therein. The punch merely pushes home the insert, which is made a press fit in the scalp. Ejection is done by a pair of reciprocating latch fingers attached to the ram. These hook under the scalp flange and pull it upward free of the dial pins. Then the assembly is blown into a chute by an air jet and it is ready for assembly of the top or cap. Insert assembly is done at the rate of 30 per min.

The knob cap or top is produced as a drawn cup having a rounded bottom and is made in a

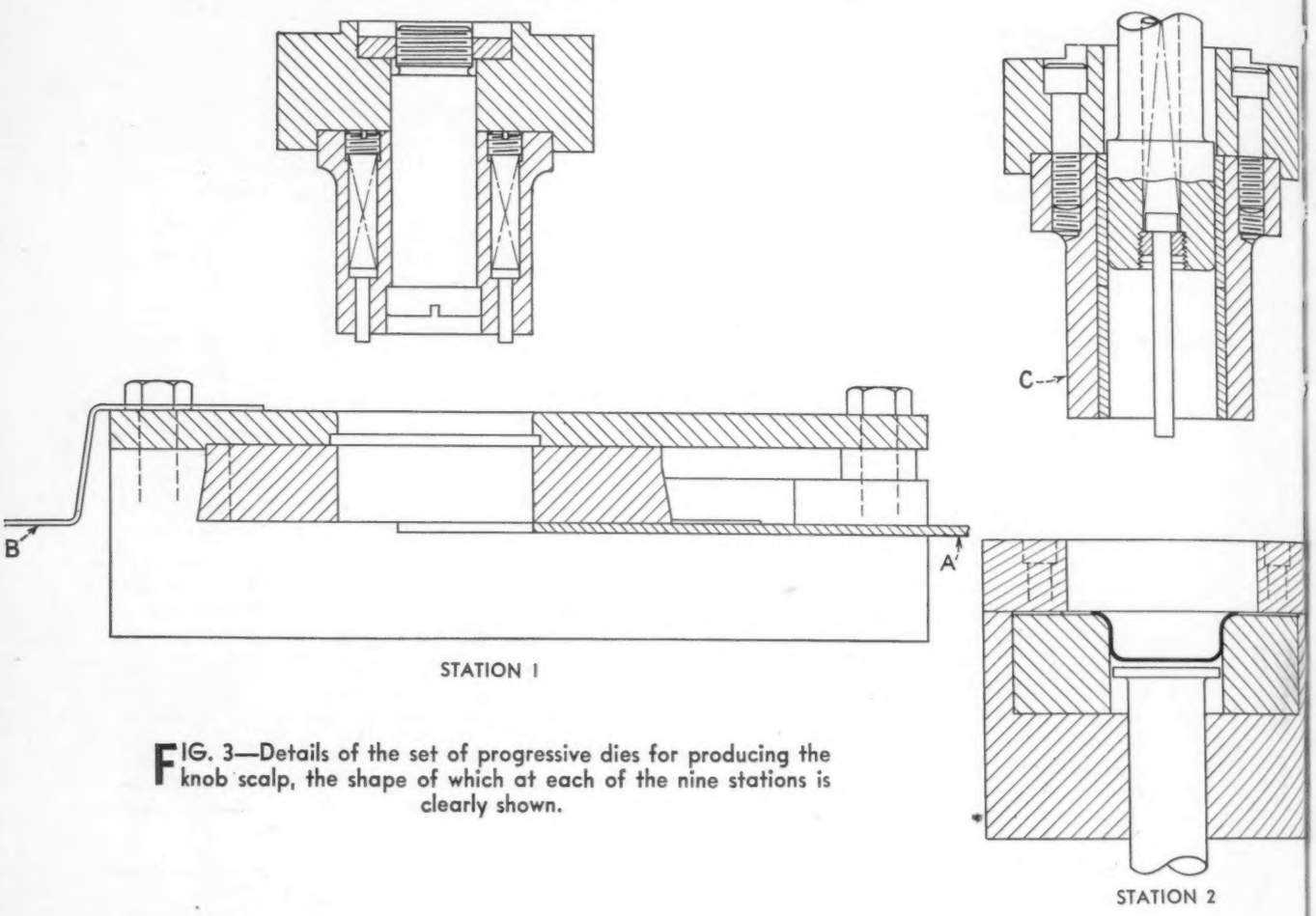


FIG. 3—Details of the set of progressive dies for producing the knob scalp, the shape of which at each of the nine stations is clearly shown.

double-acting press setup. A section through the die used is shown in fig. 6. This combination die has a hollow punch that first blanks the piece and then, after further downward motion, acts as a pressure ring while the central punch, in combination with the draw die, produces the draw. The punch also pushes the cup, completely formed, through the die so that it falls into a chute, hence, no other ejecting device or separate stripper is needed.

Deep drawing strip stock, 0.035 in. thick, used for this operation, is fed from a reel onto a flash reel, the latter producing the required pull. With this setup, 58 cups a min are produced. Cups are then delivered to a lathe where they are trimmed to length in a conventional operation and are then ready for assembly to the scalp.

Assembly is accomplished in the press setup shown in fig. 7. Scalps with inserts in place are fed down a chute from a bin at the left and tops (the drawn and trimmed cups) down a chute from a bin at the operator's right onto a bed in front of the dial which the operator loads by hand.

There are 12 stations on the dial and in each one is a curling die ring, the function of which is to form the metal of the skirt of the top inward, and direct it into the annular slot provided for it at the open end of the scalp. The latter is set into the ring and is centered by it before the drawn top is placed above the scalp in the same ring.

This arrangement is shown in the die, fig. 8, that also shows the punch which is only a ram having its lower end formed to fit the contour of the top. The punch merely applies sufficient pressure to cause the skirt to be curled inwardly until its edge makes a solid contact with the bottom of the annular groove in the scalp. When this is done, the forming of the hollow knob is completed. Tops grip the scalps so securely that there is no chance of any loosening of the tops. It is the top of the knob that fits the hand and the top must not turn independently of the scalp.

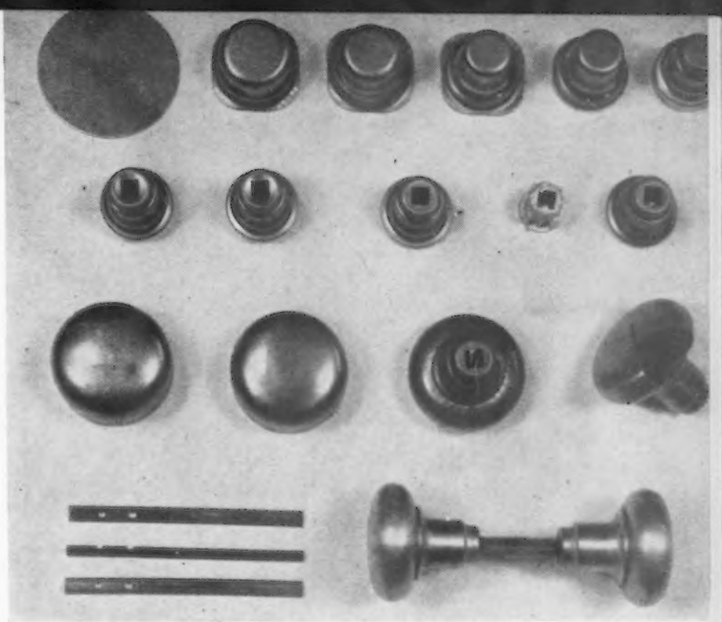
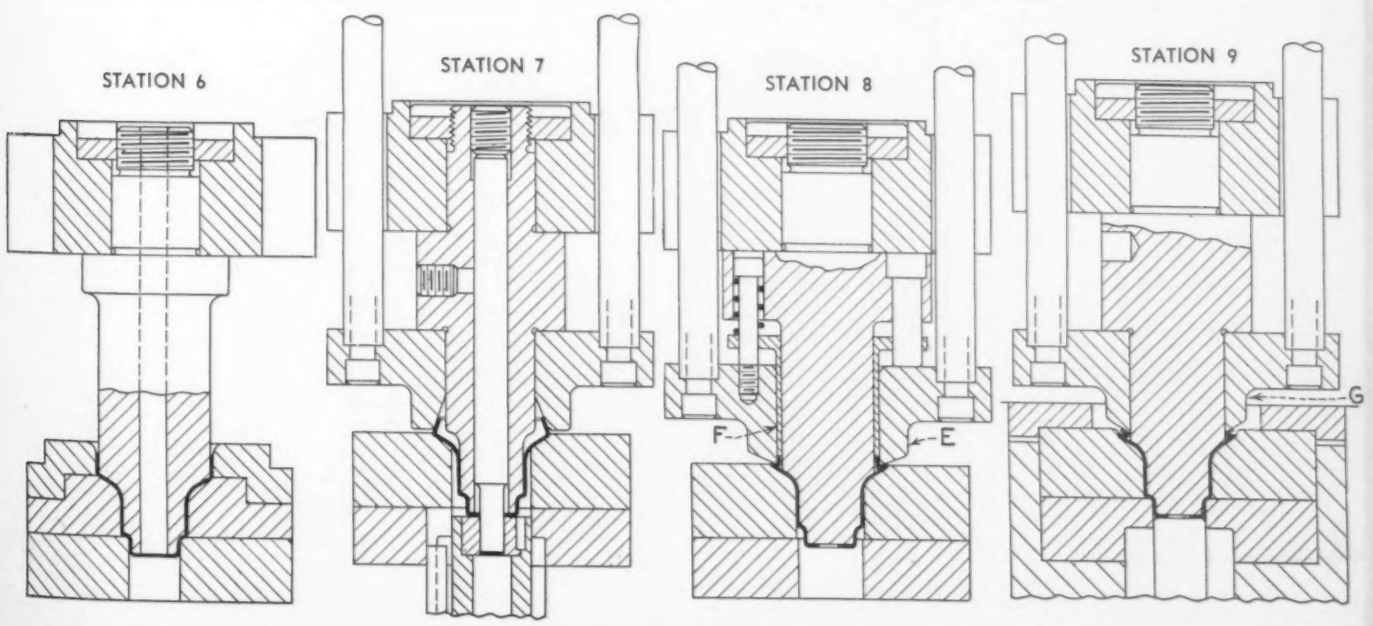


FIG. 4—Knob in successive stages of production and as completely assembled. Two top rows show the scalp from blank to finished piece and the diecast insert. In third row are two caps and two assembled knobs one of which is cut away. Bottom row shows a three-piece spindle and two knobs assembled to a spindle.

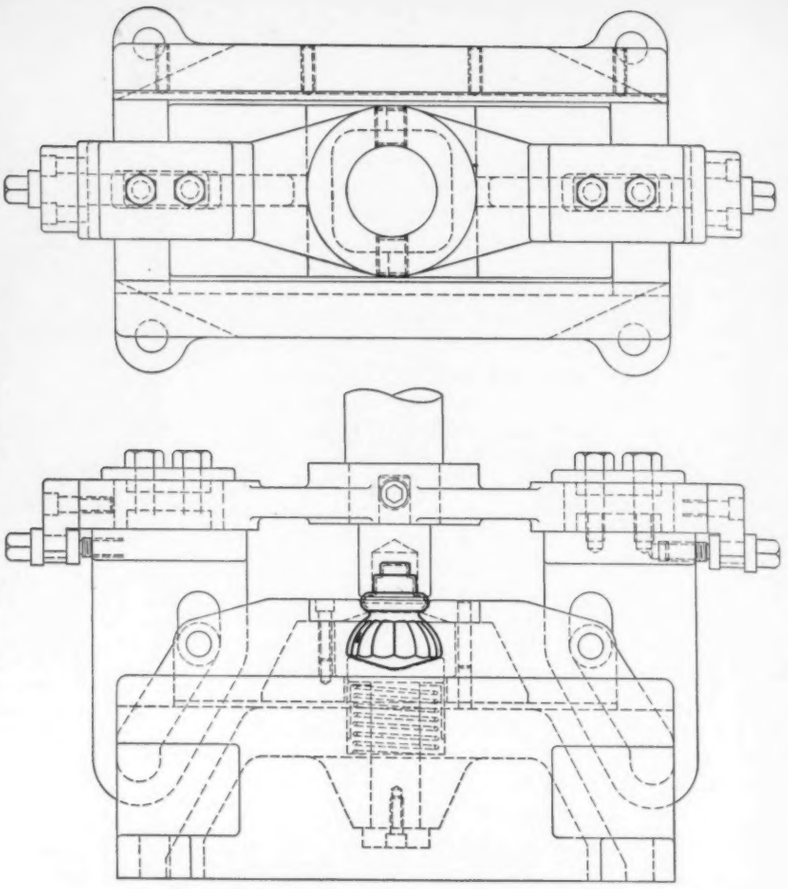
Assemblies are handled through this setup at the rate of 33 a min, the knobs being ejected into a chute by an air jet after the dial carries them past the station where the ram applies pressure to effect the curling. To make sure that the tools perform as required, all knob assemblies are delivered to the test setup, fig. 9. There the operator slips the knobs one at a time over a square spindle that is rotated slowly. The operator grips the knob with a special holder that is lined with a friction material and is closed by hand pressure, as in operating a pair of pliers.

If the torque applied is sufficient to raise a pair of weighted levers (which, in effect, mea-

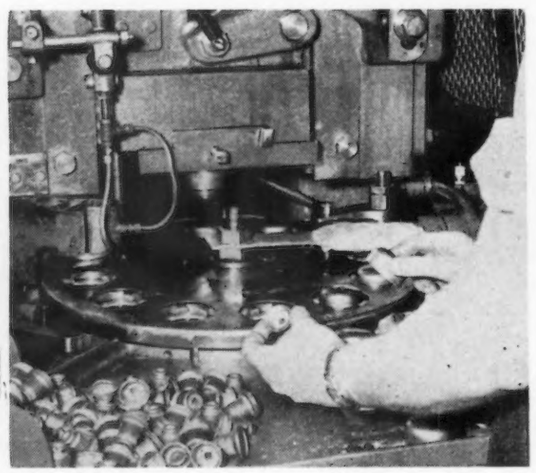


ABOVE AND RIGHT

FIG. 5—Dial setup in which a punch presses a diecast insert firmly into scalps with square holes registered by pins. A latch lifts each assembly off the pin and an air jet ejects the assembly into a chute.



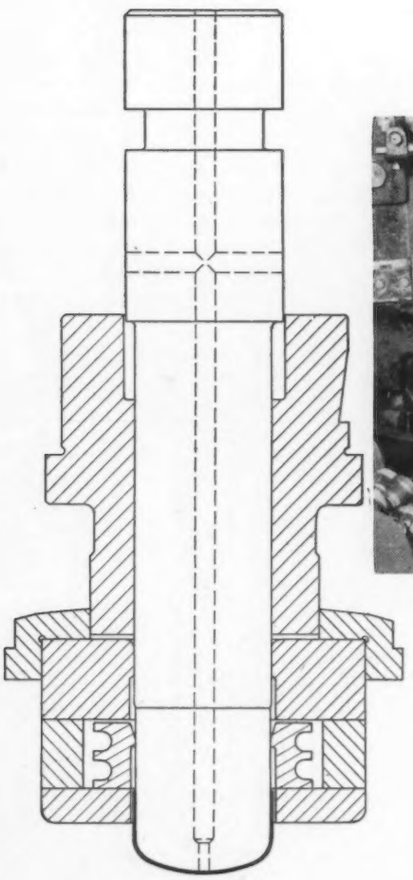
o o o



LEFT

FIG. 7—Dial setup in which scalp, with insert in place, is assembled to a cap centered above the scalp. As the ram descends, the cap is curled inward and is forced into the annular groove at the top of the scalp.

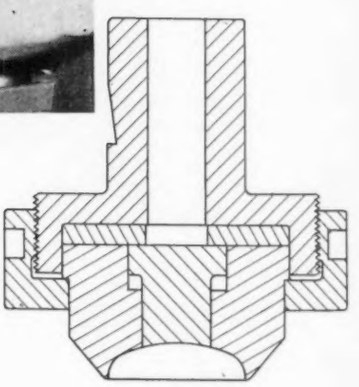
o o o



ABOVE

FIG. 6—Section through the die in which caps are blanked and then drawn. The central punch carries the piece through the die which acts as a stripper on the up stroke.

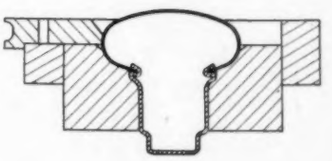
o o o



RIGHT

FIG. 8—Section through the die that curls the cap into the groove of a scalp set on the die and effects a tight assembly. The diecast insert, previously pressed into the scalp, is not shown in this drawing.

o o o



sure the torque), the knob passes this inspection operation. Settings are such that if there is any looseness between the top and scalp it will be revealed in this test. All knobs that pass this test are ready to receive whatever applied finish is specified for the particular run in process. Most steel knobs are brass plated.

Knobs produced in the manner described are excellent in appearance, and the joint between the top and scalp leaves no exposed sharp edges and is so concealed that only close examination will reveal that the knob is not actually a one-piece structure. In general, the top is plain, but in some designs, it is embossed before it is assembled to the shank.

After the finish has been applied, knobs are delivered to the Kingsbury setup, fig. 10, so that the shank can be drilled and, in some cases, tapped for the pin or screw used to fasten the knob to the spindle. This machine has one loading and six working stations and operates automatically except for loading and unloading. Only three working stations are used, however, on any given run of knobs.

When the knob is to be permanently pinned to the spindle, the shank is drilled half way through at the first working station and half way through from the opposite side at the second working station. At the third station, one hole is counterbored from the bottom so as to fit the head of the attaching pin, which is a drive fit in the hole, and is flush when driven home.

When the shank is to be fitted with a setscrew, the scalp is drilled at the first working station then in use, countersunk at the second and tapped at the third. In drilling, the drill first passes through the scalp and then (as it is correctly positioned by the key in the square hole of the diecast insert) enters a cross hole originally cored in the insert and only slightly enlarges this. There is thus no significant loss of metal or of time in producing the hole. The three working stations for the screw fastening are those not used for the pin fastening.

Spindles over which knobs are fitted are of two types. The solid type is a square bar having three holes near each end. These bars are drilled and tapped in a Kingsbury machine. This machine has one loading and nine working stations. At the first working station, two holes, one near each end, are drilled through. At the next station, each of these holes is countersunk from the top and from the bottom. Next, the two holes are tapped.

At each of the other two sets of three stations, other pairs of holes are similarly drilled, countersunk and tapped so that, when the work returns to the unloading position and is kicked out by a mechanical knockout, all six holes have been drilled, countersunk and tapped with correct spacing to make the spindle adaptable for doors of different standard thicknesses. The machine indexes, operates and ejects automatically; hence the operator has only to load the piece.

The second type of spindle is made in three pieces which, when assembled, form a square section. This type is used with setscrews that bear on that part of the spindle which is of

FIG. 9—Machine in which knobs are mounted on a slowly rotating spindle and are then gripped by a hand tool which acts as a brake to make sure that the cap is firmly anchored to the scalp. The weight measures the torque applied.

triangular section and rests between the two other parts which are of prismatic section. As the screw is tightened the triangular portion is forced down between the two prismatic sections which thus are spread apart and press tightly against the walls of the square hole in the knob insert. This arrangement is designed to make an exceedingly tight fitting knob which will not loosen in service.

In the foregoing, mention of only a few details that enter into the production and assembly of door hardware has been made, but it is clear that parts described are well designed for quantity production and that this production is not only rapid but efficient and results in products well adapted for the competitive market.

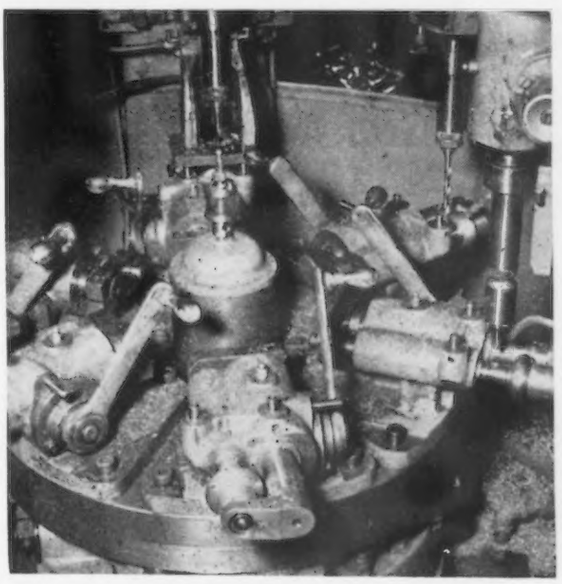


FIG. 10—Kingsbury setup in which knob shanks are drilled and tapped. Other stations not shown are arranged to drill and counterbore for a pin when a set-screw is not used.

New Deep Hardening C

TABLE I

Comparison of Present Carburizing Steels and SuperKore Alternates

Typical Applications	Present Carburizing Type Steels	SuperKore Alternates for Present Steels
Aircraft gears, shafts, pinions, etc.	E-3300, E-9300 series or equivalent AMS Specification	A
Heavy duty truck and tractor gears, shafts, pinions, etc.	3300, 9300 series	AA
Heavily loaded gears, shafts, pinions, etc. and carburized parts such as are used in the oil well drilling industry.	4800 series	B
Miscellaneous gears, shafts, pinions, etc.	4300 series	C

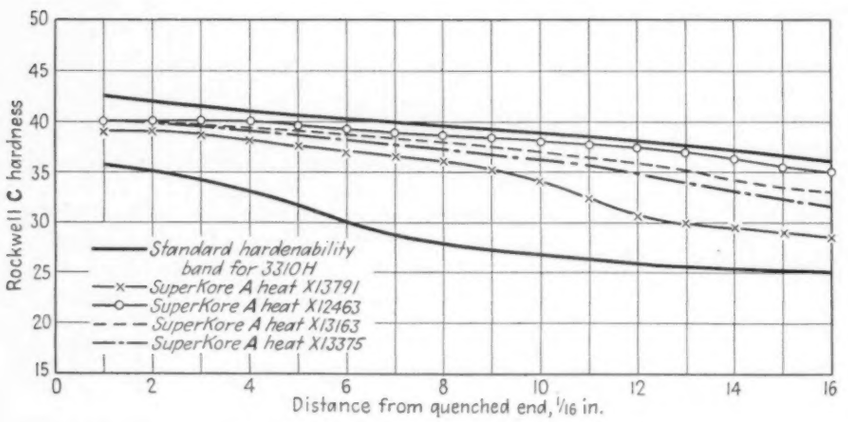


FIG. 1—Comparison of hardenability characteristics for 3310H type steel and SuperKore A.

TABLE II

Average Core Physical Properties of 1-in. Rounds

	Tensile Strength, 1000 Psi	Yield Strength, 1000 Psi	Elongation, Pct	Reduction in Area, Pct	Izod Impact, Ft-lb
E-3310[1]	180	155	13	57	48
SuperKore A[1]	168	120	15	58	50
E-3310[2]	180	170	21	59	46
SuperKore A[2]	180	120	15	52	35
4815[3]	180	155	14	53	38
SuperKore B[3]	185	155	14	51	38
4815[4]	165	145	15	54	38
SuperKore B[4]	160	145	11	53	35
4317[3]	180	135	13	50	26
SuperKore C[3]	170	132	11	45	45
4317[5]	128	90	18	58	63
SuperKore C[4]	172	165	12	57	48

[1] Pseudo-Carb at 1700° F; oil quench; draw 350° F
[2] Pseudo-Carb at 1700° F; reheat 1550° F; oil quench; draw 350° F
[3] Pseudo Carb at 1700° F; oil quench; draw 300° F
[4] Pseudo-Carb at 1700° F; reheat 1550° F; oil quench; draw 300° F
[5] Pseudo-Carb at 1700° F; reheat 1500° F; oil quench; draw 300° F

A NEW series of deep hardening carburizing steels designed to meet the need for easily fabricated airplane, truck and bus gears, shafts and pinions subject to heavy duty service, have recently been announced by Carnegie-Illinois Steel Corp. These new steels are being identified as U S S SuperKore and represent the result of 2 years of intensive development work.

Utilizing experience gained during the war, a special melting practice has been perfected in these steels to make the most effective use of available alloying elements, thereby permitting the user to apply more economical grades than were formerly possible. In addition to this raw-material economy, these steels are reported by Carnegie-Illinois to have improved carburizing, annealing, and machining characteristics in applications where heavy duty service formerly required the use of more highly-alloyed carburizing steels, such as the 3300, 4300, 4800 and 9300 types. At the same time, the new steels retain the essential physical properties necessary for the applications for which they are intended.

The data presented herein, supplied by Carnegie-Illinois, are based on production heats made for various experimental orders and are assembled to show a direct comparison (see table I) between the more highly alloyed grades and the recommended alternate SuperKore steel. The recommendations are general only and it should be noted that SuperKore steels should be applied in accord with metallurgical and physical needs of the part to be manufactured.

SuperKore A and AA

Hardenability—SuperKore A and AA have hardenability equal to or slightly greater than the 3300 or 9300 type steels of similar carbon content. Figs. 1 and 2 present this data for the two grades.

Physical Properties—Available test results indicate that the properties of SuperKore A and AA are comparable to those of the 3300 and 9300 steels of similar carbon content. Typical properties are given in table II.

Carburizing Characteristics — Experimental work, together with some production experience, indicates that SuperKore A and AA have more

Carburizing Steels

desirable carburizing characteristics than the 3300 or 9300 steels of similar carbon content. This improvement is most noticeable in the decreased amounts of retained austenite and massive carbides in the SuperKore steels.

Machinability and Heat Treatment — Reports from users indicate that SuperKore A and AA have improved machinability characteristics, when properly heat treated, in comparison with the 3300 and 9300 steels of similar carbon content.

The machinability of SuperKore A has been found satisfactory following a heat treatment of normalizing from 1650° to 1700°F and tempering at 1200° to 1275°F. Satisfactory machinability of SuperKore AA may be obtained by using the same treatment. However, SuperKore AA has machined satisfactorily after a cycle anneal consisting of heating to 1700°F, holding for 2 hr, cooling at a rapid furnace cool to 1200° to 1250°F, holding at this temperature for 10 to 12 hr and air cooling to shop temperature. This cycle may be varied sufficiently to adapt the process to conventional industrial cycle annealing furnaces.

Present data indicate that SuperKore A and AA may be carburized by standard carburizing procedures. For quenching after carburizing, however, an austenitizing temperature of 1550° to 1600°F is suggested for full hardening of the core. Although this temperature range is somewhat higher than that recommended for the 3300 and 9300 series, fig. 3 indicates that the higher temperature range is necessary to insure complete carbide solution.

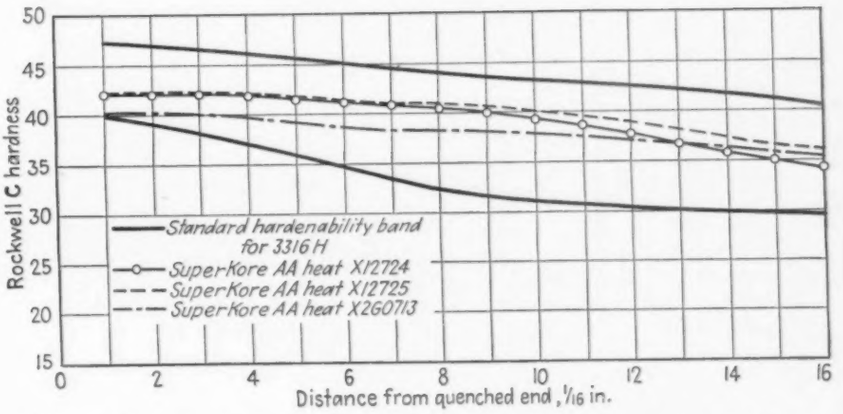

Rockwell C hardness
Distance from quenched end, 1/16 in.
Standard hardenability band for 3316 H
SuperKore AA heat X12724
SuperKore AA heat X12725
SuperKore AA heat X2G0713

FIG. 2—Comparison of hardenability characteristics for 3316H type steel and SuperKore AA.

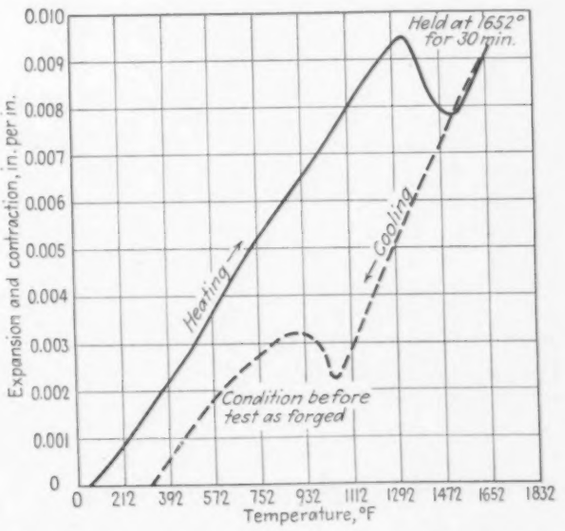
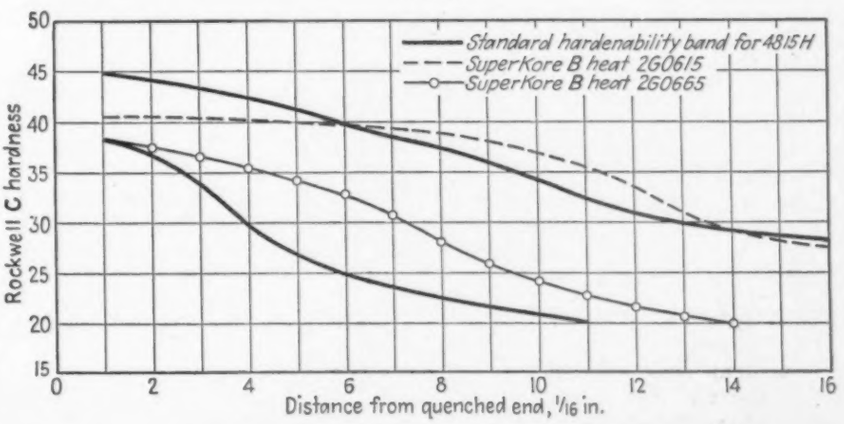


FIG. 3—Temperature dilation curve for SuperKore A. Fast furnace cool from 1652°F.

FIG. 4—Comparison of hardenability characteristics for 4815H type steel and SuperKore B.


Rockwell C hardness
Distance from quenched end, 1/16 in.
Standard hardenability band for 4815H
SuperKore B heat 2G0615
SuperKore B heat 2G0665

SuperKore B

Hardenability — SuperKore B has hardenability equal to or slightly greater than 4800 steels of similar carbon content, see fig. 4.

Physical Properties— Available test data indicate that SuperKore B will be comparable in properties to those of 4800 steels of similar car-

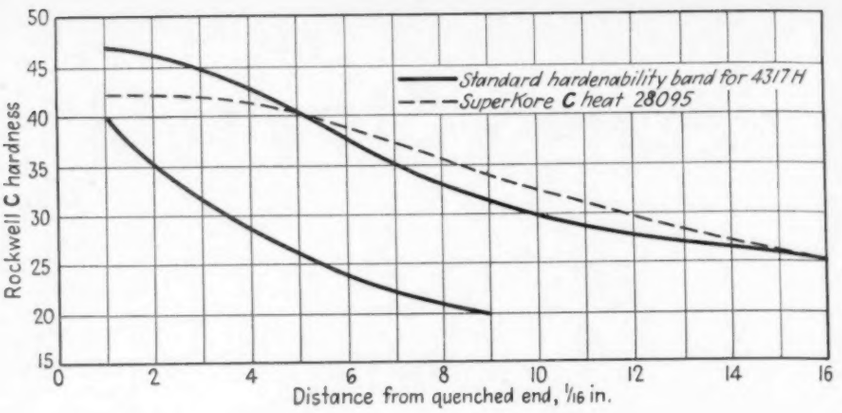


FIG. 5—Comparison of hardenability characteristics for 4317H type steel and SuperKore C.

bon content. Typical properties are given in table II.

Carburizing Characteristics — Experimental work, together with production experience, indicates that SuperKore B has improved carburizing characteristics over 4800 steels of similar carbon content.

Machinability and Heat Treatment—Information from users indicates that SuperKore B has satisfactory machinability when properly heat treated.

The annealing treatment involves a substantially shorter furnace time than the annealing cycle for 4800 steels of similar carbon content. After heating to approximately 1700°F, the steel is cooled rapidly to 1200° to 1250°F, held for about 1 hr and furnace cooled to 650° to 750°F. Surface hardness will be about 207 Bhn. The resulting machinability is very satisfactory and the surface finish good. Normalizing and tempering at 1200° to 1275°F is also effective.

Test results show that very good core properties are obtained by a direct quench after carburizing, see table II. If it is desired to reheat SuperKore B after carburizing, a reheating temperature of 1550°F is recommended.

SuperKore C

Hardenability—SuperKore C has hardenability equal to or slightly greater than 4300 steels of similar carbon content, as illustrated in fig. 5.

Physical Properties—Available data indicate that SuperKore C will equal or surpass the properties of 4300 steels of similar carbon content. Typical properties are given in table II.

Carburizing Characteristics — Experimental work, together with some production experience, indicates that SuperKore C has improved carburizing characteristics over 4300 steels of similar carbon content.

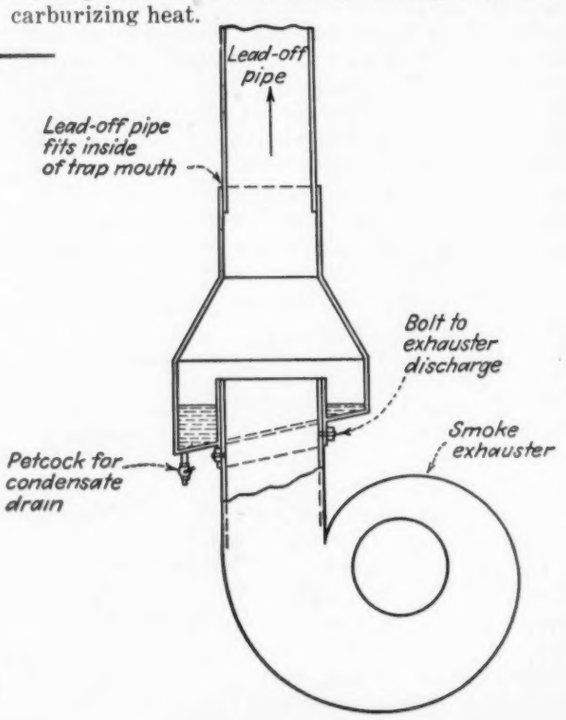
Machinability and Heat Treatment—SuperKore C may be prepared for machining by the same treatment as given for SuperKore B. Normalizing followed by tempering at 1200° to 1275°F also gives satisfactory results.

Information on carburizing characteristics indicates that a good case may be obtained by any of the usual methods. For obtaining the best core properties of SuperKore C, it is recommended that the steel after carburizing be reheated to 1550°F for quenching. As evident from table II, both strength and ductility are improved by reheating rather than direct quenching from the carburizing heat.

Oil Condensate Trap Designed For Smoke Exhausters

A TRAP designed to eliminate the adverse effects of oil condensation where smoke exhausters are used with heat treating furnaces and which can easily be made in most shops, is shown in the accompanying illustration. This design, reported by Carl F. Burling of the Boston branch of the Lindberg Engineering Co., is said to overcome the problem of oil vapors condensing in the vent line and collecting in the fan housing or running down and dripping over the assembly to the floor, as is frequently encountered where sizeable amounts of work are run and which is particularly bad when the work tempered is not to be washed following the quench.

The trap shown in the accompanying sketch has a sloping bottom with a petcock at the lowest point where the oil can be drained off.



Forging Failure Caused By Carbon Pick-Up

By MARTIN B. GRAHAM
Metallurgist,
Boston Naval Shipyard,
Boston

An investigation of a fracture in a forged steel link, which led to the conclusion that the failure was caused by carbon pick-up during a heating operation with oil-fired furnaces, is reported herein. The author also points out the need for checking heating furnaces for excessive carbon deposits arising from thermal decomposition of fuel oil.

WHILE considerable attention has been given by the forging industry to the matter of avoiding damage to steel from excessive temperature,[1, 2] there appears to be no reference to carburization as another possible source of injury to bar steel during heating for forging. That carbon pick-up can inadvertently occur and subsequently reveal itself in the form of serious weakness in the finished forging has been demonstrated at the Boston Naval Shipyard. A carburized case has been found localized in spots on the surface of a number of forgings heated in oil-fired furnaces and has been attributed to inadvertent contact of the steel with carbon during the heating cycle. Source of carbon for this action has been traced to deposits of petroleum coke which sometimes accumulate at the mouth of burner tunnels due to cracking or thermal breakdown of the fuel oil.

The particular forging discussed here is a socketed U-shaped member formed by hot bending and piercing of 1 in. diam NE8627 steel bar stock for subsequent processing into anchor chain links in a drop hammer. Heating of the bar steel to 2100°F for these operations is carried out in a two-burner box type furnace fired from the sides with a light oil (viscosity at 100°F, SSU 35).

Following manufacture, the forged links in the form of lengths of chain measuring 90 ft long are required to withstand a proof test load of 84,000 lb in direct pull. Considerable tonnages in the present size had been successfully manufactured and proof tested when a series of fractures was encountered in a new lot at loads amounting to less than two thirds the normal expected strength. In each case the fracture was of a sharp and brittle type with no visible stretch in the failed end of the link, as shown by a representative sample in fig. 1.

Visual examination of the herringbone pattern presented by the fractures indicated the point of origin of failure in each instance to be in a layer of apparently damaged surface metal. Treatment with 50 pct HCl developed patches in the surface having a mottled and pitted appearance. Metallographic examination of a section at this point revealed a novel carburized structure having a depth of about 0.040 in. as shown by a photomicrograph of a nital-etched sample, fig. 2. A similar section etched with sodium picrate to bring out cementite is shown by fig. 3. Vickers hardness number on the observed case amounted to 633 compared to 229 for normal steel in the forging.

Referring to the photomicrographs, it is apparent that the case is composed of two distinct and sharply differentiated layers. Structure of the outer layer is suggestive of cast iron of the

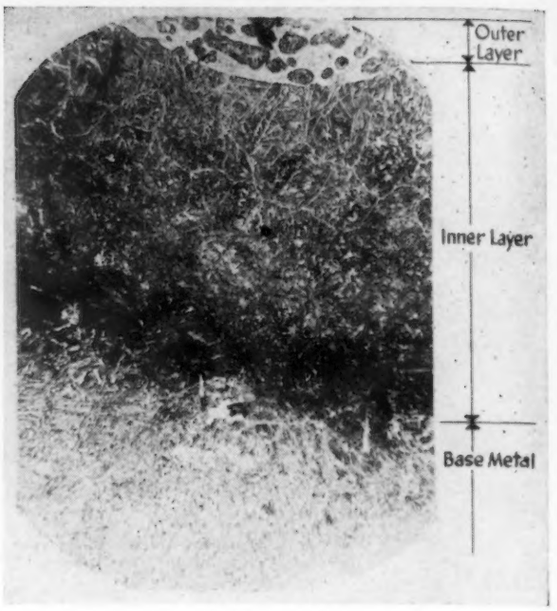
LEFT

FIG. 1 — Fracture which developed in the bent end of a forged link during a loading test.

o o o

RIGHT

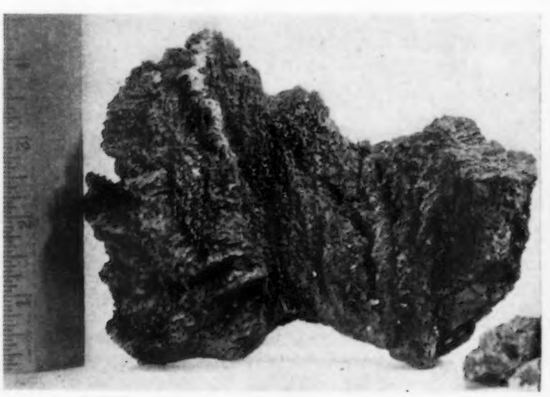
FIG. 2—Photomicrograph of metal at origin of fracture shown in fig. 1, indicating a carburized structure. Etchant 2 pct nital; 100X.

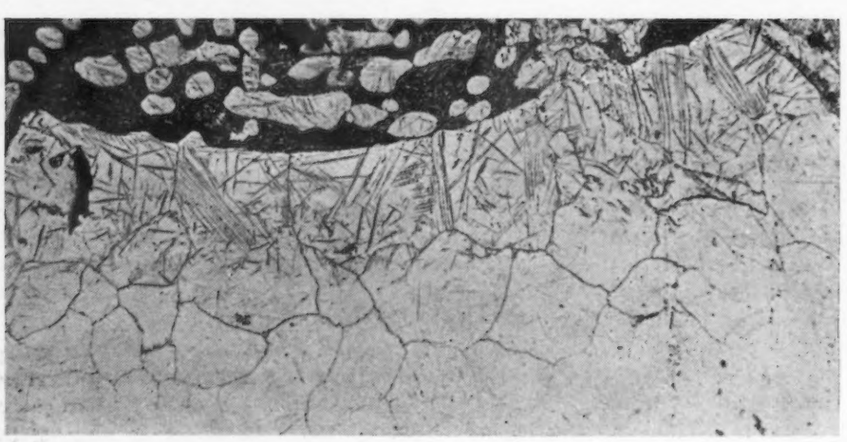


white variety containing approximately 2 pct C, while the inner layer presents a gradation from hypereutectoid steel to hypoeutectoid base metal similar to a conventional carburized structure. The sharp demarcation between the two layers suggests that partial melting of the outer layer may have occurred at the temperature of 2100°F attained by the bar steel in the forging furnace. It may be mentioned in this connection that a solidus temperature of 2066°F for iron-carbon alloys containing more than 1.7 pct C is given by the iron-carbon constitution diagram.[3]

On the basis of these findings, it was apparent that brittle failure of the forged links under load could be attributed to the action of localized spots of carburized metal at points of high stress on the link surface. As for the source of the damaging carbon pick-up, accidental contact with carbon or carbonaceous material during the heating cycle was suspected and accordingly a search for contaminating carbon was instituted throughout the inside of the furnace. An abundant accumulation was found around the mouth of the burner tunnels, a sampling of which is shown in fig. 4. It may be noted from the photograph that the carbon shows a coke-like, porous structure, a condition which is reported to be particularly conducive to carburizing action.[4]

From the evidence at hand it was tentatively concluded that carburizing action on the bar steel that failed had resulted either from contact of the steel directly with carbon at the edge of the burner tunnel or from fragments of the carbon falling or being blown on to the furnace hearth.





ABOVE

FIG. 4—Specimens of petroleum coke taken from burner tunnel of an oil-fired furnace.

o o o

LEFT

FIG. 3—Same specimen as shown in fig. 2, but repolished and etched with alkaline sodium picrate to reveal cementite. 100X.

The indicated heating temperature of 2100°F would be expected to promote rapid carbon absorption[5] and would also account for the exceptionally high carbon content of the case. As a confirmatory test in this connection, a sample of the initial NE8627 bar steel was placed on the hearth in contact with fragments of carbon removed from a burner tunnel and heated to 2100°F for 1 hr. With respect to depth and structure, the resulting case exactly duplicated that found in the forgings that failed.

Concerning origin of the carbon in the furnace, it appears to be a petroleum coke product resulting from cracking or thermal decomposition of the fuel oil on striking hot refractory surrounding the burner tunnel on the inside of the furnace. This action may be regarded as essentially the same as the coking on refractory ignition blocks described in detail by Trinks.[6] Possible contributing factors are deflection of the atomized oil stream due to slight obstruction in the burner tip, unsatisfactory air distribution, or insufficient clearance at the tunnel exit. That the buildup of contaminating petroleum coke as described above is not necessarily an isolated incident is indicated by similar findings in other oil-fired furnaces subsequent to the observed failure. Varying amounts of carbon deposits have been observed even with comparatively new furnaces. This would suggest the need for periodic inspection and conditioning of all such oil-fired furnaces with thorough cleaning out of carbon deposits wherever found.

The opinions expressed in the paper are those of the author and do not necessarily reflect the views of the Navy Dept.—Ed.

References

[1] Forging Handbook, by W. Naujoks and D. C. Fabel. ASM, 1939.

[2] Steel and Its Heat Treatment, Vol. I, by D. K. Bullens-Batelle. John Wiley & Sons, Inc., 1938.

[3] The Metallography and Heat Treatment of Iron and Steel, by Albert Sauveur. University Press, 1938.

[4] H. W. McQuaid, "Action of Solid Carburizers" Carburizing Symposium, ASM, 1937.

[5] M. A. Grossman, "A Review of Some Fundamentals of Carburizing", Carburizing Symposium, ASM, 1937.

[6] Industrial Furnaces, Vol. II, by W. Trinks. John Wiley & Sons Inc.

Constituents of Arcwelding Electrode Coatings

ALTHOUGH the coatings for electric welding electrodes necessarily vary considerably with the many different manufacturers, particularly as regards the quantities of each constituent, there are many basic elements which enter into each of the standard types. The accompanying tables indicate what these elements are and the extent to which each is used in standard electrode manufacture, and also the chief function of each in the mixture. The data in the accompanying tables were compiled by engineers of Allis-Chalmers Mfg. Co., Milwaukee.

TABLE I

Basic Coating Composition of the Fundamental Electrodes

Coating Material	AWS-ASTM Electrode Classification					
	E6010	E6011	E6012	E6013	E6020	E6030
Gum and/or resin	3	3	3	3	0	0
Cellulose	1	1	3	2	3	3
Feldspar:						
Alkali aluminum silicates	3	3	2	2	2	2
Clays:						
Aluminum silicates	0	0	3	3	3	3
Talcs:						
Magnesium silicates	3	3	3	2	4	4
Titanates:						
Rutile, titanium dioxides, etc.	2	2	1	1	0	0
Iron oxides	0	0	3	0	1	1
Calcium carbonates	0	3	0	3	3	0
Asbestos	2	2	3	3	4	4
Ferromanganese	2	2	2	2	1	1
Potassium silicates or salt	0	2	0	1	0	0
Sodium silicates	1	2	2	3	2	2

LEGEND

0—Generally not used. 1—Used in large quantities. 2—Used in medium quantities. 3—Small amount or optional. 4—Medium amount or optional.

TABLE II

Function of the Coating Material in Arcwelding Electrodes

Coating material	Arc stabilizer	Slag former	Reducing agent	Binder	Strengthen coating	Oxidizing agent	Gas shielding	Alloying weld metal
Gum and/or resin	...	...	B	A	...	...	...	...
Cellulose	...	...	B	...	B	...	A	...
Feldspar (alkali aluminum silicates)	B	A	...	...	...	...	...	...
Clay aluminum silicates	B	A	...	...	...	...	...	...
Talcs magnesium silicates	B	A	...	...	...	...	...	...
Titanates (rutile titanium dioxides, etc.	A	A	...	...	...	...	...	...
Iron oxides	B	A	...	...	...	A	...	...
Calcium carbonates	A	B	...	...	...	B	B	...
Asbestos	B	A	...	...	A	...	...	...
Ferromanganese	...	A	A	...	...	...	...	B
Potassium silicates or potassium salt	A	A	...	A	...	...	...	...
Sodium silicates	B	A	...	A	...	...	...	...

A=Principal Function. B=Minor Function.

How to Use Carbide Cutters for Milling

By H. A. FROMMELT
Consulting Engineer, Chicago

Concluding this instructive series on the application of sintered carbide cutters to milling operations, this 20th and final section consists of a brief resume of all the data given in detail in the preceding articles. Each of the important points to be kept in mind when applying carbides to milling is enumerated in short, easily remembered form, and serves to emphasize the necessity for abiding by certain fixed rules which have been proved by experience to be essential to successful carbide operation.

THE following resume is a summarization of the data, information, discussion and considerations presented in the previous article making up the series on carbide steel milling. And thus it is an attempt to make available to busy production personnel in concise and intelligible form the results of the latest findings in carbide milling.

(1) Carbide machining, although introduced to industrial America in 1928, has not had wide acceptance except for the war years which it helped to highlight by breaking many ordnance bottlenecks.

(2) Carbide milling, although executed successfully as early as 1930, is relatively new; the carbide milling of steel dates back to 1939, when the first so-called negative angle milling was performed.

(3) Steel can be and is milled successfully with carbide at from five to seven times faster than with high speed steel; negative angles for cutting are required to protect the critical cutting edge.

(4) Solid carbide blades, wedged against movement regardless of the horsepower of the cut, and eliminating brazing, have proved their superiority both in use and in lower reconditioning costs.

(5) The included angle between the OD, the face and blade face is the critical angle for steel. It must be greater than 90°.

(6) Clearance angles are also critical; for some materials extremely so, such as wrought iron and the low carbon and stainless steels.

(7) High surface foot rates, relatively, must be used in the milling of steel; range: From 250 to 1000, depending on the Brinell hardness and the composition. See table III (Part 3, Feb. 27, 1947) for list of surface foot rates.

(8) Heavier chip loads are the rule in carbide steel milling; the thicker the chip the more protection is afforded the cutting edge.

(9) Negative angles, usually 7° negative radial rake and 7° negative axial rake in conjunction with 15° nose angle are used. Variations from these recommended angles are, however, sometimes successfully used; these angles are not critical within a considerable range of variation. See table IX (Part 10, Apr. 24, 1947).

(10) Use a steel cutting grade of carbide. This is important for success and also because a realization that these grades are widely and radically different from the so-called cast iron and nonferrous grades of carbide brings about an entirely different approach to the problem of grinding. This is most necessary for success.

(11) Horsepower consumption increases with the rate of metal removal. Hence larger machines are required to capitalize to the full on the advantages of carbide.

(12) Standard machines with normal horsepower ratings can be used successfully for carbide milling but with the necessary modifications as regards the rate of metal removal.

(13) Use a flywheel whenever possible; this makes for smooth flow of power to the cutter. This piece of equipment can frequently be applied satisfactorily on standard equipment. See fig. 31 (Part 4, Mar. 6, 1947). Electric brakes are also advisable.

(14) No coolant is used in carbide milling regardless of the material milled. In this technique the heat of work enters the chip rather than the workpiece; hence, less distortion in the finished product.

(15) Mill wrought iron and low carbon steels with high surface foot rates—as high as 1000. This prevents buildup on the blade. See figs. 9 and 10 (Part 2, Feb. 20, 1947) for illustration of this phenomenon.

(16) Use zero dish and 15° face clearance angle to successfully mill these materials.

(17) Increasing the width of the K-land sometimes is necessary to control chip. Increased width of K-land makes for more tightly curled chip and hence one more easily disposed of.

(18) Mill straight carbon steel using surface foot rate based on workpiece hardness. Use table III (Part 3, Feb. 27, 1947).

(19) Use thickest possible chip or highest chip load and still remain within the power of the machine. Relationship between feed rates and horsepower is quite direct; namely, horsepower increases about as feed rate increases.

(20) Approach every milling problem by first estimating how rapidly the metal can be removed from the workpiece (considering cross-section and general rigidity) and how much power is in the machine available for this operation.

(21) K-factor for steel is as low as 0.5; use 0.75 for determination of power required. List of K-factors is shown in table V (Part 4, Mar. 6, 1947).

(22) K-factor for heat-treated steels increases. See table V (Part 4, Mar. 6, 1947).

(23) Cutter life is reduced as hardness increases.

(24) Finish on hardened heat-treated steels is far superior to that on the softer materials.

(25) Steels, both straight carbon and alloy, have been successfully milled at Brinell hardness numbers as high as 420 on a production basis, and on a toolroom basis at 600 Bhn.

(26) Alloy steels, both treated and untreated, can be successfully milled by same technique as for straight carbon steels. Use table III (Part 3, Feb. 27, 1947).

(27) Armor plate as used in ordnance parts can be successfully milled at rates approx 20 times faster than with high speed steel cutters.

(28) Mill such materials as X1020 by increasing the width of the cutting land to curl chips tighter and thus decrease possibility of chip interference. Increase land to 0.050 in. if necessary.

(29) Mill type 304 stainless using an average of 900 sfpm.

(30) Mill stainless type 304 using standard steel cutting angles but zero dish and 15° face clearance angle. This is critical and is a must.

(31) Use 7° OD clearance angle for milling stainless 304.

(32) Use standard carbide steel milling practice for the satisfactory milling of all other types of stainless.

(33) Use relatively heavy chip loads for the milling of stainless of all types.

(34) Use negative cutting angles for the milling of so-called semisteels, controlled cast irons such as Meehanite and Linite and the alloy cast irons such as are commonly used in the automotive industry.

(35) Use Brinell hardness number to determine the proper cutting angle; above 160 Bhn use negative, below use positive.

(36) Use 300 sfpm for the milling of the harder cast irons such as semisteel and the controlled irons.

(37) Use 400 to 600 sfpm for the milling of the softer cast irons, those having 25,000 psi tensile strength.

(38) Mill cast steel with suitable grade of carbide having sufficient resistance to abrasion, and use a surface foot rate similar to that for cast iron, namely 300.

(39) Use a reasonable yardstick for cutter life determination such as number of pieces between grinds or square inches of surface milled.

(40) In production milling choose operating characteristics that will give longest possible cutter life consistent with economical cutting rates. The smaller the job lot the smaller should be the cutter life, provided only that the cutter is to be removed at the end of the lot and replaced with another cutter.

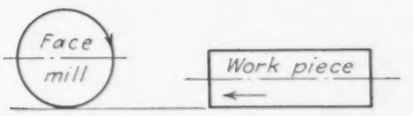


FIG. 88—For face milling the cutter should be offset from the centerline of the workpiece, and should be larger in diameter than the width of the cut in the ratio of 8 to 5 or 10 to 7 as shown.

(41) Generally speaking, the lower the surface foot rates the higher the cutter life provided the lower limit for carbide has not been passed.

(42) Prevent chipping of blades by choosing stronger carbide or eliminating vibration in the machine or the setup.

(43) Prevent undue wear or cratering of blades by choosing a less strong carbide and one having greater wear resistance. Carbide manufacturers' recommendations in this regard should be followed closely.

(44) Climb mill for the best cutter life if the machine permits.

(45) Use a heavy chip load for optimum cutter life.

(46) Set the cutter properly with respect to the workpiece. In face milling offset the cutter from the workpiece as shown in fig. 88.

(47) Use a ratio of 8 to 5 or 10 to 7, or thereabouts, when electing a face mill. That is, the ratio of the cutter diameter to the workpiece face width should be as indicated. See fig. 88.

(48) Cutter design influences life decidedly. Radial design is preferred to the axial.

(49) Good carbide milling practice results in

Previous articles in this series covering carbide milling were as follows:

Part No.	*Subject*	*Issue Date*
1.	Fundamentals of carbide milling.	Feb. 13, 1947
2.	Low carbon steel and wrought iron.	Feb. 20, 1947
3.	Straight carbon and cast steel.	Feb. 27, 1947
4.	Heat-treated steels.	Mar. 6, 1947
5.	Armor plate, heat-treated alloy steel, stress proof steel, die plates.	Mar. 13, 1947
6.	Stainless steels.	Mar. 20, 1947
7.	Semisteel, Ni-Resist, alloy cast iron.	Mar. 27, 1947
8.	Factors governing cutter life, selecting feed rates.	Apr. 10, 1947
9.	Regulating life between grinds, cutter design.	Apr. 17, 1947
10.	Factors involved in good practice.	Apr. 24, 1947
11.	Tool grinding, reconditioning and blade setting.	May 8, 1947
12.	Converting to carbide milling.	May 15, 1947
13.	Planning carbide milling operations.	May 22, 1947
14.	Analyzing the workpiece, establishing feed rates.	June 5, 1947
15.	Rating carbide milling jobs.	June 12, 1947
16.	Rating carbide milling jobs (continued), selecting cutter size.	June 19, 1947
17.	Straddle milling v. face milling.	July 3, 1947
18.	A practical conversion problem.	July 10, 1947
19.	A practical conversion problem (continued).	July 17, 1947

(1) good cutter life, (2) good finishes, (3) accuracy, and (4) economical cutting rates.

(50) Setup must be rigid; that is, the machine, the workpiece and the cutter must be rigidly and solidly held. Included is a firm foundation for the machine. Milling on the second floor of a building is usually not conducive to good results.

(51) Use a machine tool sufficiently powered for the job.

(52) Set the cut, depth, width and feed rate accurately for the power available.

(53) Properly grind the blades and cutter for good results, particularly cutter life.

(54) Grind all steel cutting grades of carbide with diamond wheels, particularly when in a rigid setup as in a cutter grinder.

(55) Roughing off of blades may be done offhand on a green wheel.

(56) Use grinding block or jig for fast, accurate grinding divorced from the human element.

(57) Use 220 grit diamond wheel, 6 in. diam, $\frac{3}{8}$-in. face, 6000 sfpm, run with a solvent such as kerosene or equivalent.

(58) Grind on the periphery of the wheel, not the face.

(59) Take 0.0005 in. per pass in grinding, or less, not more.

(60) If grinding in a cutter grinder, eliminate one of the compound angles, the positive radial blade setting of 15°, before attempting to grind the zero dish angle. Otherwise a zero angle will not be ground.

(61) Set blades on the machine if possible. If production schedule does not permit, set on a fixture but use a positive stop instead of an indicator.

(62) Conversion to carbide program must begin with the top management to be successful.

(63) Responsibility with proportionate authority must be delegated to some one individual on the management level.

(64) An adequate educational program must be established, first for the management on the economics of carbide milling, and secondly, for the production personnel in the know-how. This includes time study, wage incentive personnel, inspectors, foremen, group leaders, operators and fixture designers.

(65) An application of carbide program is established successfully by beginning with the simple operations. These are also used for educational work.

(66) An adequate follow-through program is necessary to insure obtaining the desired results continuously and permanently.

New Books

"Industrial Apprenticeship," by Paul Bergevin. Recent advances, from new teaching methods to specific material on public school apprentice training including the federal government's program and veterans training in the trades are described. The book is written with a minimum of technical terms. McGraw Hill Book Co., 330 W. 42nd St., New York 18. 280 p. $2.75.

* * *

"Materials of Industry," by Samuel Foster Mersereau. Fourth edition revised by Calvin G. Reen and Kenneth L. Holderman. New material on industrial materials widely used today, such as petroleum, concrete, glass, alloy steels, magnesium, synthetic rubber, and plastics have been included in this edition. McGraw Hill Book Co., 330 W. 42nd St., New York 18. 632 p. $2.80.

* * *

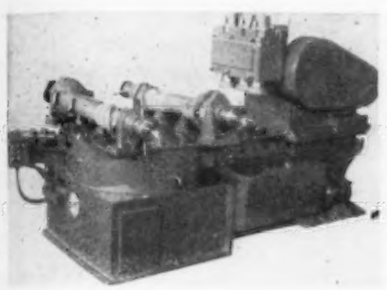
"Materials Handbook," by George S. Brady. Sixth edition contains revised reference information needed in preliminary discussions of purchasing requirements and lists primary requirements of industrial executives, designers and builders of mechanical equipment with information on materials entering into international trade. McGraw Hill Book Co., Inc., 330 W. 42nd St., New York 18. 831 p. $7.00.

New Equipment . . .

New developments in vertical milling machines, briquetting presses, plastics molding machines, roller levelers, surface grinders and punch presses are discussed in the following pages. A spectrum source unit, dryer- coolers, power shovels, bus ducts, sediment strainers, plating tank floats and surface finishes for plastics are also described herein.

Vertical Milling Machine

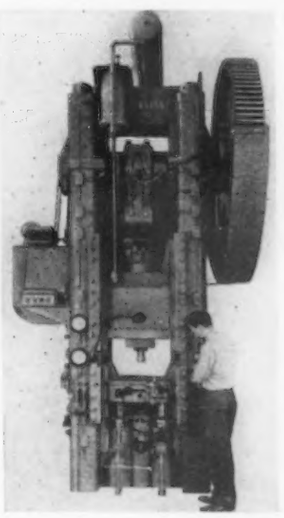
TYPE VMI vertical milling machine designed by *Davis & Thompson Co.*, Milwaukee 14, has been adapted to the production milling of the two top pads on a clutch



housing. Three spindles are provided for milling, two of which are mounted with interlocking cutters. Cutter spindles are driven by a 20 hp motor, worm and wheel and a gear train to furnish spindle speeds of from 82 to 328 rpm. Each cutter spindle has a micrometric vertical adjustment of 1¼ in. A 2-station hand clamping fixture is mounted on a hydraulically driven indexing table. The milling head is mounted on a bed having hardened and ground steel ways. Cycle of operation is fully automatic. Production is variable from 40 to 80 pieces per hr, depending on speed of operator in loading and unloading. Weight is 20,700 lb.

Briquetting Press

A BRIQUETTING press designed to extend metal powder application to large, irregular cross-sections has been developed by the *E. W. Bliss Co.*, 450 Amsterdam Ave., Detroit 2. The operating principle of this 345-ton mechanical press combines triple hydraulic lower motion — floating die table, core rod and stripper. The mechanically actuated slide has a 10-in. stroke which can be adjusted to 5 in. The speed of the slide can be adjusted from 6 to 9 strokes per min and from 9 to 18 strokes per min. All hydraulic cycles are initiated by the mechanical cycle, which can be inched for setup, single-stroked for tryout, or run continuous for production. Specifi-



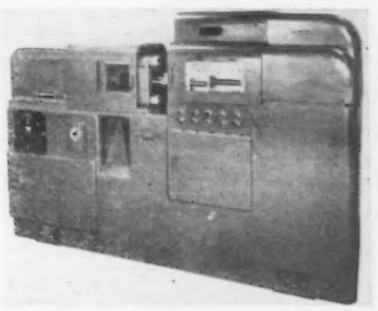
cations include: Capacity of slide, 345 tons; die table, 120 tons; core rod, 60 tons; stripper (eject up), 75 tons.

Roller Leveler

TO flatten thin-gage sheet metals that cannot be satisfactorily leveled by conventional types of levelers, *Voss Machinery Co.*, 2882 W. Liberty Ave., Pittsburgh 16, has designed a backed-up roller leveler having ¾-in. diam work rolls which flatten alloy and perforated sheets from 0.010 to 0.030 in. thick and up to 28 in. in width. All controls are from levers mounted on the top of the machine and a handwheel located below them. The lower flight of rolls is tiltable and not the upper flight of rolls as is the usual form of design. The unit is known as the Inverted Type Leveler.

Plastics Molding Machine

FEATURING streamlined appearance, rugged construction, and rapid operation, the Fellows-Leominster 1B-2 plastics injection molding machine built by *Fellows Gear Shaper Co.*, Springfield, Vt., has a molding capacity of 2 oz per shot, at a speed up to 6 shots per min, depending on the product and the design of the mold. The plasticizing capacity is 45 lb per hr, accomplished by means of a specially designed heating cylinder. These features, together with a 30-in. casting area, 150-ton clamp, 5-in. stroke, and platen area for molds up to 10½ x 13½ in. or a No. 2 D.M.E. standard mold base, make the machine suited for production runs of small industrial items and

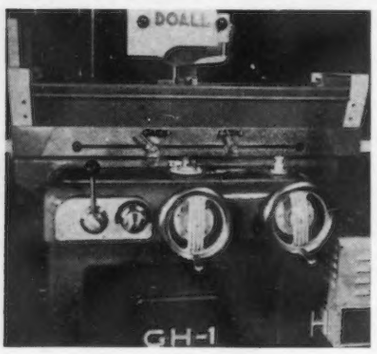


short runs on larger items. All hydraulic, electric and water-cooling controls are within easy reach for both setup and automatic operation. Speed and pressure of injection, and speed of mold closing are controlled.

Surface Grinder

IN designing Model GH-1 Handraulic surface grinder, the *DoAll Co.*, Des Plaines, Ill., has combined finger tip control with

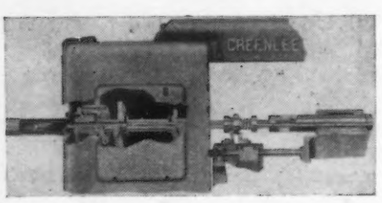
automatic power feeds. A direct coupled hydraulic cylinder is used to power the table movement. Starting, stopping and reversing the table is controlled by a selfcentering 4-way valve which is operated by a hand lever. Table speeds are variable from 5 to 50 fpm and a



new type combination trip dogs regulates length of table travel. The trip dogs can be set to stop the table either automatically by returning the control lever to neutral or instantly at a predetermined point regardless of lever position. The unit is equipped for dry grinding. Working surface of the table is 6½ x 19¾ in.; distance from table to bottom of 7-in. wheel is 12 in. max.

Threading Attachment

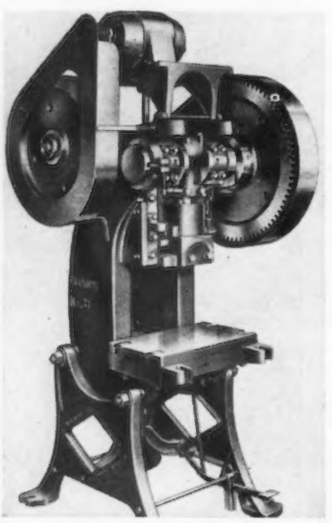
SIX-SPINDLE automatics of 1, 1⅝ and 2-in. bar capacity, manufactured by *Greenlee Bros. & Co.*, Rockford, Ill., can now be furnished with a new, improved arrangement to handle lead-screw threading, which is said to eliminate many secondary operations



and helps speed production of workpieces requiring threads with a very accurate lead. The threading arrangement is a combination cam-and-lead-screw-operated mechanism, and can be used in 3d, 4th, and 5th positions. The arrangement incorporates a "relieved-type" lead-screw threading spindle which is different in design from earlier lead-screw equipment of the company's automatic screw machines. The lead-screw attachment, itself, consists of a threading spindle unit, a removable 1-in. OD lead screw and bronze nut, safety shear keys, an outboard bearing support, and a yoke to operate selfopening die heads. The threading spindle drive shaft is approximately 10 in. longer than the conventional drive shaft. Standard cams operate the quick approach and rapid return strokes of the attachment.

Back-Geared Punch Press

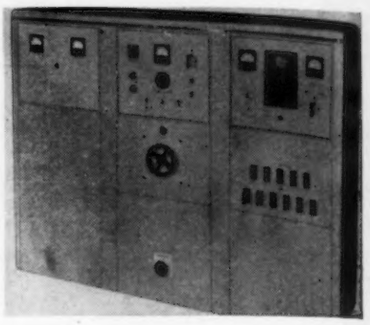
A BACK-GEARED 31-ton punch press, announced by *Diamond Machine Tool Co.*, Los Angeles 23, is said to differ from their 30-ton model by the addition of the back gears and in a stronger frame design. Bed area from front to back is 13 in. and from right to left 22



in. Standard stroke is 3 in.; overload protection is rated at 100 pct. The press is mounted on heavy semisteel cast iron legs and cradle arrangement permits operation of the press at any desired degree of inclination. Gibs, sliding surfaces and crank shaft are microfinished. All stock parts are interchangeable.

Spectrum Source Unit

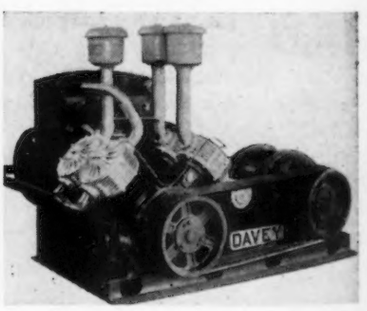
FOR spectrochemical analysis, a high precision source-unit designed specifically for high quantitative precision and accuracy has been placed on the market by *Applied Research Laboratories*, 7707 Michigan Ave., Detroit 10. The unit provides two basic spectrum sources, one of high voltage and frequency used for the higher percentage determinations, and one of low voltage and frequency used for lower percentage analyses. Both sources employ the principle of



completely separate charge and discharge cycles, which is said to provide a high degree of reproducibility. The high voltage source utilizes 240 spark trains per sec of short duration for excellent sampling; the low voltage source, 60 arc discharges per sec of long duration for high sensitivity. A wide range of circuit constants can be furnished to provide optimum conditions for any type of sample to be analyzed.

Air Compressors

A LINE of two stage, air-cooled industrial air compressors of 60, 105, 160, 210 and 315 cfm capacities has been announced by the *Davey Compressor Co.*, Kent,



Ohio. Known as Air Chief Industrials, these machines feature permanent peak efficiency valves and the company's equi-balanced crankshaft. Use of this crankshaft, coupled with employment of rubber vibration mounts, makes possible the elimination of heavy mounting bases and facilitates the ready removal of units

from one location to another. Air Chief Industrials are available in 4 types: base compressors, stationary units with base ready for installation of electrical equipment, departmental compressors powered by ac motors or with dc motors.

Valve Controls

SAID to provide smooth, trouble-free control in the handling of air, water, oil, gas and steam at low or high pressure or temperatures, a line of valve controls has been announced by the *Shafer Valve Co.*, Mansfield, Ohio. They make possible a fast or slow opening or closing valve with current used only to open or close the valve. No current is required to maintain the valve in either open or closed position. Only three wires to the control and two control switches at the operating center are required and the control will operate on either 110 or 220 ac or dc. Valves operated by valve controls may be installed in any position it is said. Controls are available for the operation of valves from 1 in. up, and for pressures ranging from 25 to 6000 lb.

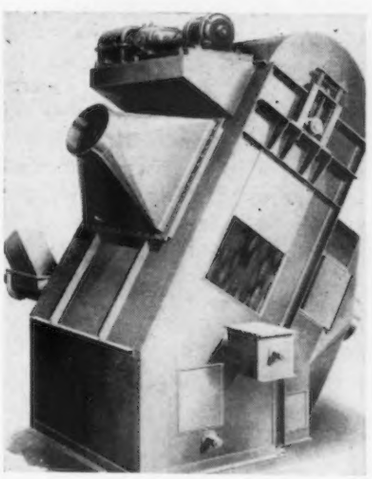
Sediment Strainer

A DUPLEX or twin sediment strainer has been developed by *J. A. Zurn Mfg. Co.*, Erie, Pa., for use in pipe lines where continuous flow is imperative. When

the strainer is to be cleaned flow can be diverted from one basket to the other without interrupting passage through the strainer. The unit operates by means of a single plug type valve whose openings direct flow from the inlet to either basket, or both simultaneously. Plug action is claimed to be positively nonfreezing. Dual relief valves are furnished, with flanged or screwed connections, and suitable for working pressures from 125 to 300 lb. A basket chamber cover yoke assembly, or C-washer type bolted cover assembly is available. They are made in bronze, steel, semisteel, or special alloys to specifications. Sizes range from 1 to 6 in.

Dryer-Cooler

THE Multi-Louvre dryer-cooler designed for materials requiring short treatment time or multiple drying temperatures, by *Link-Belt Co.*, 307 N. Michigan Ave., Chicago 1, is flexible in that it is possible to dry, cool and process



materials in the same unit. The moving element in the dryer consists of two strands of roller chain with specially designed flights, suspended in such a way as to provide means for keeping the bed in a constantly flowing mass. The material flows in a shallow bed over the ascending flights and at the same time is gradually moved across the dryer from the feed point to the discharge point. The gases are pulled from the furnace and permeate through the moving bed of material. At this point the heat from the inlet gases is transferred to the material and the evaporation of moisture occurs. The entire area of the dryer is covered by the suction from the exhaust fan, to assure a practically dustless operation. The air for drying can be heated by steam coils or by a gas or oil furnace.

1-Ton Fork Truck

FOR inter-plant movement of material involving transit over uneven ground and rail crossings, for use on rough and slippery docks, in all operations where maximum

traction and driver-comfort are essential, *Clark Tructractor*, Battle Creek, Mich., has announced the Yardlift 20, a streamlined pneumatic tired gas-powered fork truck of 2000 lb capacity. Standard models have tiering heights of 72 and 118 in.; optional uprights provide for heights from 60 to 144 in. The pivoted steering axle combines stability and flexibility, it is said. The truck also features a new type of seat with adjustable back rest. The truck has an outside turning radius of only 69 in.

Power Shovel

DESIGNATED the 33-M, a ¾ cu yd machine which may be used as a shovel, dragline, clamshell, crane and backhoe with various front-end attachments, has been added to the line of equipment manufactured by the *Marion Power Shovel Co.*, Marion, Ohio. Features claimed for the new unit include Marion air control, a simplified machinery deck with only two shafts across the deck, simple change-overs for front-end equipment, the use of 22 ball and roller bearings and only 12 gears for the entire machine. The same drums are used on all combinations and the shovel boom also serves as the boom for the backhoe. The crane boom point is adaptable without change for crane, clamshell, dragline and pile driver service. Air control covers all digging motions, gear changes and the operation of the steering clutches, propel brake, swing brake, dipper trip and engine clutch. The 33-M is the smallest machine in the Marion line.

Universal Feeder Bus

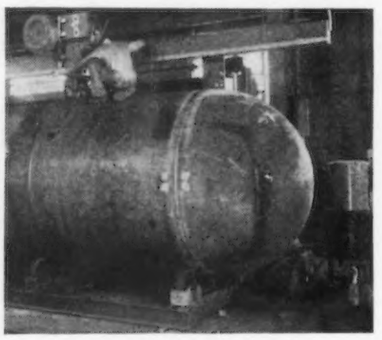
SPECIFICALLY designed for conducting runs of large alternating currents, the universal feeder bus being marketed by *National Electric Products Corp.*, Chamber of Commerce Bldg., Pittsburgh, has prime installation value where voltage drop must be minimized. Available in 800, 1000, 1350, 1600 and 2000 amp capacities, this ventilated feeder bus is being produced in these types: 2 pole-single phase, 3 pole-3 phase, and 3 phase-4 wire. Protected by an expanded steel mesh on all sides, the bus bars are interlaced, wrapped and insulated to assure the least possible temperature rise. To secure an easy and fool-proof method of joining the 10-ft sections, the silver-plated ends of the individual bus bars are bent outward and edgewise at a 45° angle. A steel bolt, fitted with large flat and lock washers, is inserted to draw the bus bar ends together in a firm and positive joint. Cable lugs or other bus bars can be bolted at these joints for desired take-offs.

Bus Duct

THE Federal Noark bus duct, manufactured by the *Federal Electric Products Co.*, 50 Paris St., Newark 5, N. J., is a continuous electrical bus bar distribution system housed in a sheet metal enclosure. Rugged channel construction of the enclosure together with insulated plug-in openings are said to assure safety in applying and removing plug-in devices. These combination bus bar insulators having plug-in opening on 12-in. centers, represent an important feature of the bus duct. Other features are its adaptability to a virtually limitless range of power distribution problems; its flexibility in providing for plant and production expansion; and the availability of power it provides at any point. The bus duct is manufactured in standard 10-ft lengths.

Tank Welding Unit

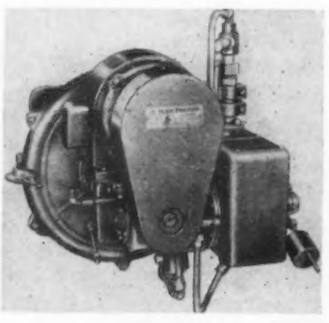
ANNOUNCED by *Reed Engineering Co.*, Carthage, Mo., is a positioning and welding unit for use with automatic welding heads in production of tanks, pressure vessels, boilers and other cylindrical shapes by the automatic welding method. Adaptable to any standard welding head, this unit combines both a variable speed work rotation and welding head support in one basic unit. The automatic welding head is mounted on the longitudinal track which op-



erates parallel to the work and is power adjusted both vertically and laterally by remote control. The turning roll mechanism has infinite variable speed drive with multiple rubber tired wheels for rotating and supporting the work. The unit is made in two sizes: Model SD for work up to 84 in. diam and Model SDH for work up to 120-in. diam. Track lengths range up to 40 ft and can be used in pairs to provide dual operation on vessels up to 80 ft in length.

Fuel Oil Burners

INDUSTRIAL fuel oil burners said to stabilize the feeding rate of fuel, regardless of changes in the fuel oil temperature or viscosity,



have been announced by the *Iron Fireman Mfg. Co.*, 3170 W. 106th St., Cleveland. The burners are rotary cup type with capacities from 8 to 125 gph. The new series delivers the same quantity of oil, no matter how thick or thin, it is said, and provides even feed at maximum burning rate or throttled down completely. No regulating valve or viscosity compensating device is required.

Plating Tank Floats

TO minimize chromic acid loss, reduce heat waste and lessen vapor escape, *Hanson-Van Winkle-Munning Co.*, Matawan, N. J., has introduced polystyrene tubes known as Chrome Spray Floats which form a blanket on the surface of the solution in chrome plating tanks. The tubes which are 2¾ in. long and completely enclosed are laid on the surface of the solution to a thickness of about 1 in., forming a blanket which is said to cut escaping spray to a minimum. Approximately ½ lb per sq ft of solution surface area is required. The tubes do not adhere to or interfere with the work in the tank, it is reported, and can be used indefinitely.

Surface Finishes

DEVELOPMENT of a line of clear and colored surface finishes for polystyrene plastics has been announced by *Monsanto Chemical Co.*, St. Louis 4. The lacquers are reported to overcome the tendency of solvents to produce crazing in polystyrene. They are available either clear or pigmented and are said to resist oil and protect the polystyrene. The finishes were developed to make possible the coating of the face or the back of clear moldings in color and to provide wipe-in colors for dials, trademarks and decorations. The lacquers can be sprayed and will dry rapidly to a hard, adherent and mar-resistant finish of high gloss, it is said. Wipe-on coatings or coatings applied to inlays are usually applied by brush.

Toggle-Action Clamp

CALLED the Jumbo, a heavy, toggle-action clamp has been announced by *Knu-Vise, Inc.*, 2213 Eighth St., Detroit 16. With a man's normal pressure on the handle it is capable of exerting a pressure of 1350 lb at the extreme end of the toggle bar, it is claimed, and the deflection at the spindle is not more than 3/16 in. due to design of the base which comprises an integral front bracket and a back support. The spindle can be adjusted longitudinally along the toggle bar to accommodate various placements of work at pressure point without the necessity of changing original location of clamp.

YOU'RE FIGURING FUEL-COST-PER-TON
— FINISHED, INSPECTED AND SHIPPED

YOU CAN'T AFFORD DOWN-TIME
FOR POT REPAIR OR REPLACEMENT

YOU WANT THE WORK AND THE PROCESS
(NOT THE FIRING) TO FIX THE POT SHAPE

the logic of KEMP tin and lead melting shows up

FUEL costs, for melting, as in tinning, patenting or dip-heat-treating, are no small factor in the ultimate cost-per-ton of product. Therefore, the opportunity to cut them 30 to 40% by more efficient firing is something to think about.

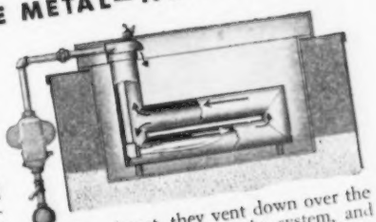
It's not at all unusual for a switch to KEMP immersion-firing to save that much—because the heat (all of it) is liberated right in the molten bath, not outside the pot. And none is lost to the setting except by flow through the work.

By the same token, pot wall temperatures are lower (from the molten material temperature *down*) —and more uniform! That's why you enjoy longer pot life with less down-time for maintenance and repair.

And KEMP immersion-firing tubes can be of any shape you wish. They can be located in the bath where most convenient to your work and your process. You have full freedom in specifying setting style.

There are 29 years of experience in carbureted-combustion and immersion-melting behind the coupon in the corner. Use it.

WITH MODERN IMMERSION-FIRING YOU HEAT THE METAL—NOT THE POT



Combustion is within tubular loops totally immersed in the metal. Recirculation of hot combustion gases around each loop (driven by force of the burner flame) promotes efficiency and uniformity of temperature over the tube surface. When the hot gases do exhaust, they vent down over the molten metal surface, reducing heat losses from the system, and minimizing dross. Standard designs have metal capacities from 2 to 20 tons—special sizes and shapes, and larger capacities, quoted on request.

PRECISION CARBURETION + ADAPTED COMBUSTION FOR INDUSTRY'S HEAT-USING PROCESSES

ATMOSPHERE GENERATION & ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL AND PROTECTION

JMLco K-G2 1a

The C. M. Kemp Mfg. Co.
405 E. Oliver St., Baltimore 2, Md.

Have a field-engineer come look at our salt and soft-metal melting set-ups. We want to save 30 to 40% in fuel cost ☐

NAME_____

TITLE_____

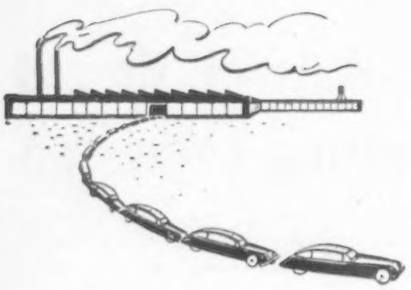
COMPANY_____

PLACE_____

Assembly Line . . .

WALTER G. PATTON

• GM closes its plants for a week . . . Higher prices seen for 1948 models . . . Packard's new convertible displayed in dealers' showrooms.



DETROIT—The recent GM announcement that all passenger car production will be halted for a week commencing July 21 was not surprising to many steel suppliers here who have been following the Fisher Body steel situation. At the moment it is reported that Fisher's flat rolled steel inventory is at an all-time low and the shutdown became necessary to build up a sizable inventory that will permit continuous operations.

For the past 3 weeks Fisher Body has been trucking steel directly from the mills to GM assembly plants to bolster its dwindling supplies. Steel has been shifted from one GM plant to another to obtain better balance of stocks on hand. During the past week Fisher began to cut up its widest sheets intended for turret tops in order to obtain necessary sheet for quarter panels, hoods and other parts requiring smaller sheets.

The GM shutdown will close immediately all Fisher fabricating and assembly plants in Michigan as well as all Chevrolet, Pontiac, Oldsmobile, Buick and Cadillac assembly plants in Michigan. Chevrolet truck production which was recently curtailed to permit a model change will be continued. GM truck and the appliance and engine divisions of the corporation will also continue to operate without interruption.

Approximately 115,000 hourly rated employees in Michigan will be immediately affected by the shutdowns. After materials on hand are consumed GM assemblies outside of Michigan are also slated to come to a halt. This will involve an additional 65,000 hourly-rated employees.

MOST observers here have accepted the fact that the prices of 1948 model cars will be higher than the present prices of comparable models.

While no immediate price announcements are looked for it is quite evident that the rising price spiral is the most formidable problem faced by the industry today. While some manufacturers may boost the price of present models, it is believed that most of the upward price revisions will be made when the 1948 models are announced.

There are many reasons why price increases are being widely talked about in Detroit. For one thing the buying public still likes big cars—and fancy cars. Every customer survey shows this. To cite an example, several years ago one of the leading manufacturers made a serious attempt to cut down on chromium plating. A storm of protest came from both dealers and consumers. It seemed that the lack of chromium had a very adverse effect on the prices the cars bring on used car lots. After that experience chromium plating went back on passenger cars. It's still there in generous amounts—except for a few truck models.

When Ford made a survey to determine what people really wanted in a light car the company learned to its surprise that what motorists really wanted was a *low-priced* car. Motorists didn't want to give up roadability, roominess, power and other things that increase the cost of a car. They wanted even better and sometimes bigger cars than the present models — but at lower prices.

Another reason why car prices seem certain to rise is that tooling costs are up two or three times as compared with prewar, partly because tooling is more elaborate and also because toolmakers are being paid higher wages to do, if anything, less work per hour.

ALL of the larger auto producers except Studebaker have now granted the equivalent of 15¢ per hr increase to their workers. Ford has agreed to give the union a wage increase of 7¢ plus an old age pension plan that will cost the company a minimum of 15¢ per hr.

While the predicted increase in steel prices has been translated by some sources into an increase of $10 per car, past experience has shown that it is the *cumulative* effect of such price changes which determines the ultimate effect on car prices. For instance, if only a few of the thousands of firms supplying the industry use the steel price change as an excuse to raise prices, car prices will probably go unchanged. However, if a sizable number of the industry's suppliers boost the price of their products, a corresponding increase in car prices can be expected.

Engineering costs have gone up too. Some sources have estimated that GM spent several million on its light car before abandoning the project. The Ford light car, also abandoned or placed indefinitely on the shelf, will also run into the millions. Another producer, Willys, has postponed its reentry into the light passenger car field. Both the desire to continue its engineering plus restrictions due to high manufacturing costs and shortages of materials are believed to have prompted the Willys decision to hold off on its proposed light car.

Cars are constantly getting heavier and more elaborate. Nearly all the new Oldsmobiles and Cadillacs for example, are equipped with Hydra-Matic transmissions. The trend toward automatic transmissions is so pronounced that at least four GM divisions are expected to offer automatic transmissions as optional equipment in the new 1948 models. Other producers are expected to follow the GM lead.

As one automobile executive expressed it, "There seems to be no end to the things buyers insist on having in new cars. The car buyers' appetite for luxury in a new automobile is practically insatiable

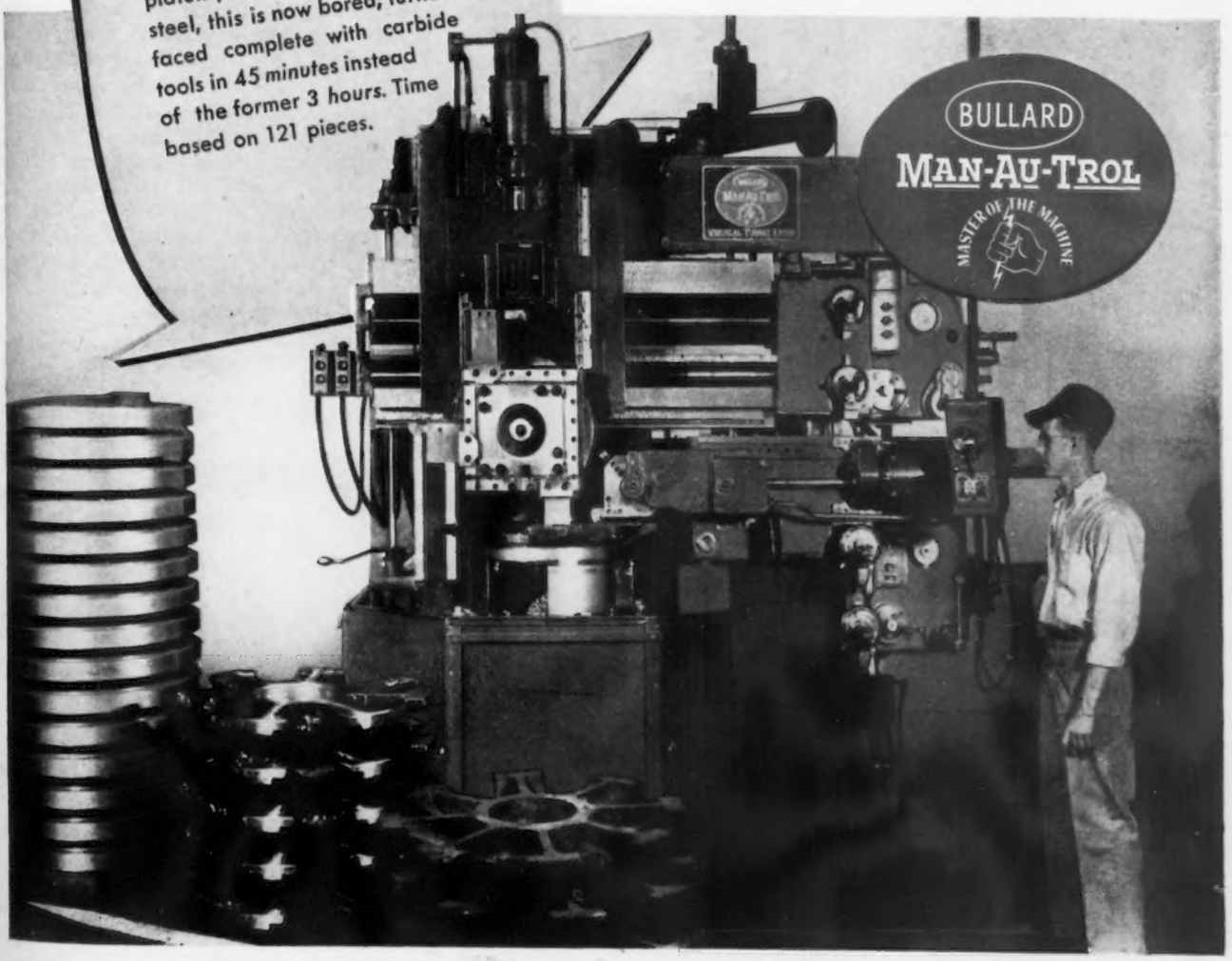
America's largest manufacturer of tire and tube curing presses reports:

Crank Gear Blanks Machined 12 Times Faster on a BULLARD Man-Au-Trol V. T. L.

BULLARD 36" Man-Au-Trol Vertical Turret Lathe is setting new production records for The McNeill Machine & Engineering Co., Akron 11, Ohio. For example: a crank gear blank of welded steel — O. D. 27.166" — which formerly took 4 3/4 hours, is now bored, finished and faced complete in 22 minutes in one setup except for the crank pin bore. Another with 28.500" O. D. is done in 27 minutes. All fractional dimensions held to 1/64" . . . all decimal dimensions to .005". Time based on 500 pieces, produced two months ahead of schedule.

Another job (illustrated here) is steam platen support for tire and platen presses: made of 1045 cast steel, this is now bored, turned and faced complete with carbide tools in 45 minutes instead of the former 3 hours. Time based on 121 pieces.

Investigate how the unique productivity, versatility and accuracy of **BULLARD** Man-Au-Trol Vertical Turret Lathes can give *you* substantial cost advantages in competitive markets. Write for Bulletin MAV-G-1 today. THE BULLARD COMPANY, Bridgeport 2, Connecticut.



BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

and the only thing that keeps him in bounds is his purse limitations. Despite a lot of conversation you may hear to the contrary, prices have not yet begun to act as an effective limitation on car buyers."

CHEVROLET is building a new parts fabricating plant at Parma, Ohio, a suburb of Cleveland. The new unit which will supply parts to Chevrolet assembly plants throughout the country will contain 1,325,000 sq ft and is expected to employ 5000. Construction on the new plant is scheduled to begin at once.

Oldsmobile turned out its 100,000 car in 1947 last week and the company still has 275,000 orders on its waiting list. This is reasonably typical of the industry and explains why the car dealer carryover into 1948 is likely to be very heavy.

A recent survey by the National Automobile Dealers' Assn. indicates that dealers have thus far been able to deliver cars to only about 30 pct of their customers.

Cancellations of new car orders for all reasons turned out to be only 16 pct. Bulk of the cancellations came in 1946 and the number of orders cancelled in 1947 was at a much slower rate. NADA interprets this to mean that most car buyers are determined to keep their places in line which seems entirely reasonable in view of the premium prices new cars continue to bring on used car lots.

The Packard Super Eight Convertible went on display for the first time this week in dealer showrooms across the country. The new model went into quantity production last month. Packard estimates the company spent $1,500,000 tooling for its new model which features completely new styling and a new powerplant. Packard predicts that the demand for its new convertible "will very likely climb faster than our ability to get into volume output stride."

Following final inspection, Kaiser-Frazer gives its passenger cars a "steam bath treatment" in which live steam is blown into the body. According to K-F engineers, the steam shrinks headlinings and other body cloth, assuring a smartly tailored fit to the upholstery fabrics.

International Body On Standards Chooses Geneva For Offices

London

• • • **The first meeting** of the council of the International Organization for Standardisation (I.S.O.) since the ratification of its constitution (drafted in London last October at a meeting of 28 nations) was held in Zurich June 17 to 20. The council consists of the national standards bodies of the following countries: Australia, Belgium, Brazil, China, France, India, Norway, Switzerland, United Kingdom, U.S.A., U.S.S.R.

The council appointed M. Henri St. Leger to be general secretary, and his office will be situated in Geneva. The meetings were presided over by Mr. Howard Coonley, of the U.S.A., who was elected president of I.S.O. in London last October.

An extensive program of technical work will be submitted to the standards organizations in the different countries for consideration.

The International Electrotechnical Commission (I.E.C.) which was formed over 40 years ago and has national committees in 23 countries, also held a meeting of its council.

As a result of the joint meetings between the I.E.C. and the I.S.O. it was agreed to recommend to the constituent members of the I.E.C. that the I.E.C. should affiliate with the I.S.O.

At the meetings of the Council of the I.S.O. representatives from the International Labor Office, the United Nations Educational, Scientific and Cultural Organisation, the International Organisation for Civil Aviation, the International Dairy Federation and the International Federation for Documentation were invited to be present, to discuss the question of collaboration between those organizations and the I.S.O., and steps to put this into effect were agreed upon. It was stressed, however, that the national standards organizations should get into touch with their own representatives on these bodies.

FARMING MADE EASY: *Featuring improved hydraulic systems of implement control and four forward speeds, these snappy new Ford tractors represent one of the first postwar products of Ford's new staff of engineers. Tractors are now being shipped to dealers by Dearborn Motors Corp., marketing organization for Ford. Present production is 400 tractors per day but this is expected to increase sharply during August. Both the blonde and the plowing equipment are listed as "extras".*

To Hold Production And Machine Tool Exhibit in Chicago

Chicago

• • • **Running simultaneously** with the National Machine Tool Builders Show to be held here Sept. 16 to 26, will be the Production and Machine Tool Show. The latter show will be held at Chicago's International Amphitheatre from Sept. 17 through 26. Some of the exhibitors include Canedy-Otto Mfg. Co., Do-All, Delta, Grob Brothers, Hobart and Lincoln Electric Co. Any company associated with the metalworking industry is eligible to exhibit.

ORNAMENTATION OF METALS

Etched zinc name plate with three-color enamel fill-in. Blanked pierced and formed.

PLASTIC AND METAL COMBINATIONS

Highly decorated center button of clear plastic, set into plastic container with decorated chrome metal strips.

Under one big roof at AUTO-LITE

The versatility of plastics, metals and plastic-metal combinations has opened unlimited possibility for the modern designer who is striving for precision and eye-catching appeal at the least possible cost.

Under one big roof at Auto-Lite's Bay Manufacturing Division are the technical skills and the equipment which provide decorative and functional developments in both plastics and metals . . . These have proved themselves essential ingredients in the development and improvement of a wide variety of manufactured products.

THE ELECTRIC AUTO-LITE COMPANY

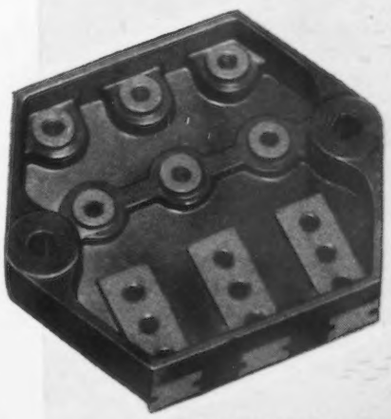
Bay Manufacturing Division

Detroit 2, Michigan — Bay City, Michigan

Tune in the Auto-lite Summer Show, Starring Parker Fennelly as "Lawyer Tucker," Thursday Nights, 9:00 P.M.—E.T. on CBS.

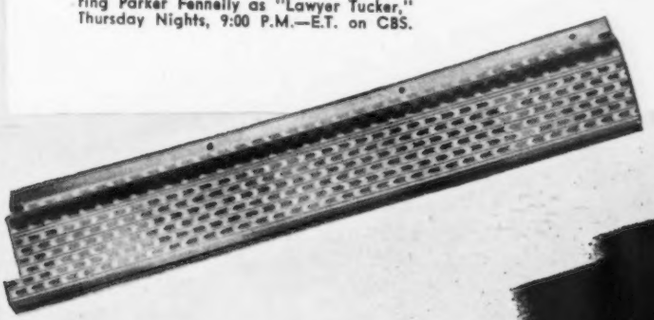
ORNAMENTAL PLASTICS

Clear plastic crest of three-dimensional casting, decorated enamel fill-in.



FUNCTIONAL PLASTICS

Plug-in thermo-setting plastic terminal with intricate metal inserts.



ROLLED AND FORMED METALS

Etched and polished aluminum scuff plate with enamel fill-in. Rolled, formed, pierced and trimmed.

Auto-Lite

Washington . . .

EUGENE J. HARDY

• Administration balks at decentralizing federal agencies . . . Weak case attacked by Republicans . . . Industry and government delay permanent legislation on synthetic rubber plants.

WASHINGTON — Some idea of how serious administration leaders are when discussing decentralization and dispersion of industry as a security measure can be gleaned from the government's own activities in this regard. Despite much loud talk on the general subject, the administration is not practicing what it has been preaching. In fact, the Budget Bureau, and other related agencies, aided and abetted by some members of Congress are arranging for the return to Washington of many agencies that were decentralized in 1942 as quickly as the job can be done.

However, administration leaders admit that this problem may have to be faced in the not too distant future in contrast to some Republicans on Capitol Hill who think the time to decentralize the government is now. The White House sees the problem as one that would require the formulation and execution of an overall security program designed, in the light of available information, to sustain governmental machinery under a variety of possible conditions.

There is a definite feeling that the government does not possess the detailed studies, expert opinions, and the background of consideration which would make possible the development of a plan for governmental decentralization.

Expert counsel needs to be obtained on scientific developments (particularly in respect to potential weapons of all kinds), military strategy, civilian defense measures, public health, transportation, communications, and a number of other subjects, according to the Budget Bureau.

It has been suggested by the bureau that the National Security Resources Board which would be created by the pending military unification bill, or a similar agency, would be the proper group to study this problem in its entirety.

ADMINISTRATION opposition to immediate decentralization is based on: (1) The belief that there is neither adequate office space nor residential housing to meet the needs of a major decentralization, and (2) wartime experience with limited decentralization indicated that, from a management point of view, the executive establishment would lose rather than gain from any large scale decentralization away from Washington.

From the national security standpoint, the administration believes that our major cities would be attacked in quick succession if any potential enemy should develop the atomic bomb. On this basis, it is assumed that decentralization and dispersion would provide only a limited degree of security and that the whole program of locating government activities would have to be planned from the specific standpoint of maintaining some central operating authority even though physical facilities in various parts of the country might be laid waste.

This theory has been attacked on Capitol Hill and leading the barrage has been Sen. Alexander Wiley, R., Wis., chairman of the powerful Senate Judiciary Committee. The Wisconsin senator maintains that the interests of scientific management are not served by centralizing 1,250,000 government workers in Washington. However, he strikes his most telling blow at the administration policy when he points out that it is foolish to say that since any potential enemy would strike at our major cities in quick succession there is no need for decentralization. As the senator sees it, this hypothesis further indicates the urgency of taking decentralization measures immediately, since elementary military strategy shows that dispersion of targets is preferable to having one concentrated target.

Senator Wiley adds that the Budget Bureau, as the President's central planning agency, should stop "passing the buck" and assume the responsibility, if only in part, for a study of the whole problem.

THE nation's war-built synthetic rubber industry will continue to stagger along under interim legislation until the 80th Congress convenes its next session in January 1948.

Before adjourning this month Congress had hoped to write legislation assuring continued operation of at least a portion of the synthetic rubber plants, however, delay on the part of government and industry in presenting their recommendations precluded this possibility.

As a result of meetings between the Army-Navy Munitions Board and the rubber industry proposals relating to a proposed synthetic rubber program were expected to be presented to Congress by June 1. Due to the complexity of the problem, these proposals did not reach the House Armed Services Subcommittee on Organization and Mobilization until July 9.

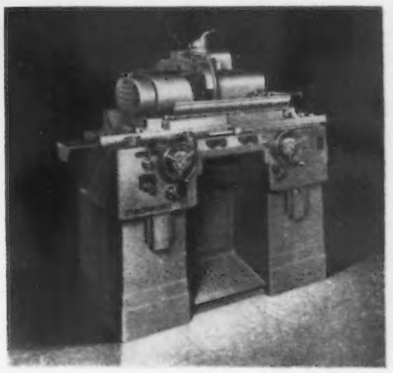
This made it impossible to rush a bill through in the dying days of the present session. In any case, Rep. Paul W. Shafer, R., Mich., chairman of the subcommittee, says that after studying the recommendations, it appears that they do not represent the majority view of the industry and ANMB but rather represent a majority view of governmental agencies.

During the recess the subcommittee will hold public hearings and make a complete study of synthetic rubber. In addition, it will make an on-the-spot study of the manu-

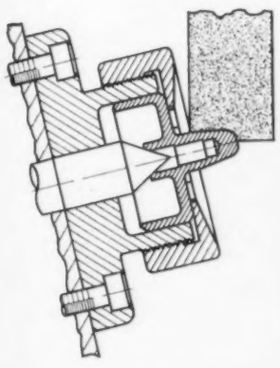
For those small hard-to-grind jobs

CINCINNATI FILMATIC 4" PLAIN HYDRAULIC TAILORED TO FIT

CINCINNATI FILMATIC 4" Plain Hydraulic Grinding Machines are built in 4" x 12", and 4" x 18" sizes. Complete specifications may be obtained by writing for catalog G-551.

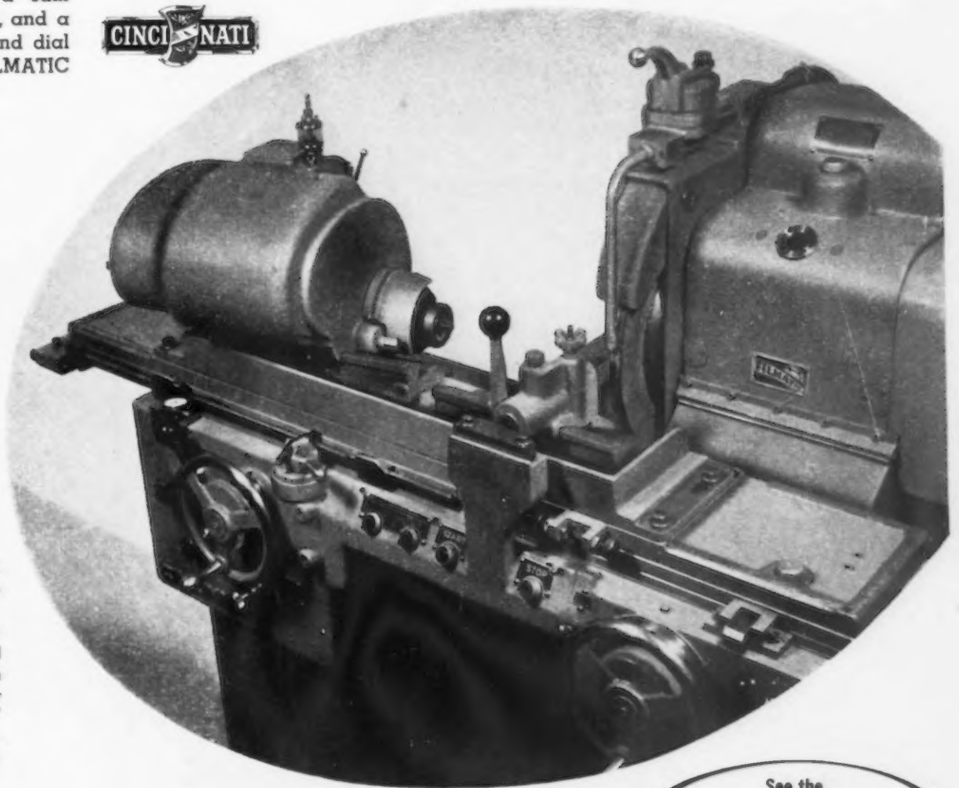


Machines which can be readily tailored to facilitate difficult grinding operations offer two principal advantages: 1) maximum production, 2) minimum investment. An example of this type of equipment is shown in the photograph below. ¶ Starting with a CINCINNATI FILMATIC 4" Plain Hydraulic Grinder, Cincinnati Application Engineers removed the standard swivel table, headstock and footstock, and replaced them with an upper table having a 12½° angular section for the headstock, a live spindle headstock with a special chucking device, a profile truing attachment operated from a cam attached to the machine bed, and a latch device, positive stop, and dial indicator for the table. The FILMATIC bearing wheelhead was retained. ¶ With the aid of an automatic infeed unit, the machine form grinds the stem diameter of stainless steel valves in one chucking of the work. ¶ This is another example of Cincinnati Application Engineering in low-cost precision grinding. Their many years' experience is at your disposal. A letter from you, with a blueprint of the part stating complete requirements, will enable these engineers to help you do a better grinding job at lower unit cost, and with minimum operator fatigue.



Drawing of part and chuck, showing wheel in contact with ground surface.

Part name.....Valve
Material.....Stainless Steel
Operation.....Grind form
Production.....38 per hour
Machine—CINCINNATI FILMATIC 4" Plain Hydraulic Grinder with special equipment tailored for the job.



Close-up of special equipment applied to a CINCINNATI FILMATIC 4" Plain Hydraulic Grinder, to form grind the stem diameter of stainless steel valves by the infeed method.

See the CINCINNATI GRINDERS DISPLAY at the MACHINE TOOL SHOW, Booth No. 306 Chicago, Sept. 17-26

CINCINNATI GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTER TYPE GRINDING MACHINES · CENTERLESS GRINDING MACHINES · CENTERLESS LAPPING MACHINES

facture of butadiene, styrene, and all other related topics of the rubber industry.

THE impact of such legislation on world markets is fully realized. Nevertheless, there seems to be little doubt that Congress will finally approve a bill providing for compulsory consumption of a more or less specific amount of synthetic rubber, which will represent the minimum necessary to maintain a technically advanced and rapidly expandable industry. It is hoped that the bill will call for the barest minimum of government controls and will not require the establishment of another government agency.

The plants are still being run by Reconstruction Finance Corp. and existing controls on rubber expire Mar. 31, 1948. Prior to that time the subcommittee believes that Congress will have enacted into law a far-reaching rubber program that will permit rubber manufacturers and natural rubber producers to plan their future with a reasonable degree of certainty.

Another problem to be taken up in the legislation is that relating to plant disposals and the effect of such disposals on concentration within the industry.

Thus, in brief, the subcommittee will conduct hearings this fall; will anticipate receiving suggested legislation from the industry along with any additional recommendations from government; will observe the industry in its actual operation; and will present a bill to Congress in January 1948 that should be acceptable to industry from the standpoint of operation and to the government whose vital interest lies in the realm of national security.

Bureau Reports Drop In Conciliation Service Of the Labor Dept.

Washington

• • • **Conciliation services** carried out by the Labor Dept. dropped 22 pct in the first half of 1947 from first half 1946 totals, the department's Bureau of Labor Statistics estimates. Only major assignments for the conciliation service during the first 6 months of the year were the coal and telephone disputes involving about 500,000 workers. Another 350,000 workers were involved in 1252 disputes to which commissioners of conciliation had been assigned.

Of the total number of work stoppages, the service managed to terminate 1152 during the first half of the year involving 775,000 workers and on July 1 it was handling 221 continuing work stoppages involving slightly more than 100,000 workers.

About 21 million man days were lost by some 1,560,000 workers in the first 6 months of 1947, BLS estimates, as compared with the same period in 1946 when almost 3 million workers lost nearly 89 million man days.

Wages and hours were major issues in some 56 pct of all work stoppages in first quarter 1947. Other issues were union organization, recognition, and the closed shop. About 5 pct of the disputes were over jurisdictional matters, sympathy demonstrations and allied grievances. Mining and construction industries were set back by about 100 stoppages each during the first quarter.

USWA By-Passes Board

Pittsburgh

• • • **In unanimous action** taken recently by its policy committee, the United Steel Workers of America decided to bypass the new labor board set up under the Taft-Hartley law. It will depend upon its own strength and relation with steel companies to reach a successful settlement of any problems which may arise in the future.

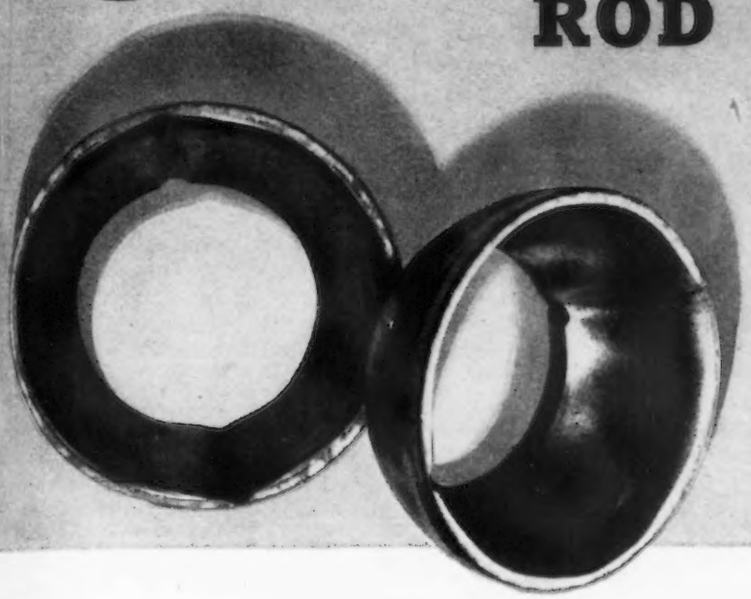
In new contracts to be signed the union will not commit itself to no-strike obligations "enforceable by harassing law suits." It will also ignore the limitations placed on political activity which are written into the Taft-Hartley bill. Observers here do not expect any change in the union's relationship with basic steel companies. Both sides are expected to bend over backwards in their attempt to keep the present contracts inviolate.

The union, before the new labor bill was passed, had signed 1050 contracts containing the no-strike provision. About 500 were still to be negotiated.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WHAT? YES, READ OFF TH' SPECIFICATIONS TO ME--
GO RIGHT AHEAD, DOC-- THIS WON'T INTERRUPT ANYTHING!
TO SAVE TIME, HE HAS TH' DOC COME HERE TO CHECK UP AND SEE WHAT TH' TROUBLE IS!
WELL, THERE IT IS--RIGHT THERE! THEY DON'T NEED NO TEST TUBES AN' STUFF!
7-25
J.R.WILLIAMS
THE MALADY
COPR. 1947 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

5 MILLION ROD BEARINGS



formed with CARBOLOY Sheet Metal Blanking and Forming Dies

...WITHOUT REFINISHING

...AND STILL GOING STRONG

Saved cost of 7 Steel Cut-Out Dies, plus 44 maintenance hours, reports Thompson Products Company, Detroit

. . . and still practically as good as new", added Thompson Products Company. After forming 5,000,000 rod bearings with Carboloy Sheet Metal Dies, the record showed that to produce the same number of pieces, 7 steel cut-out dies would have been necessary. This saving also eliminated 44 hours in die maintenance time, resulting in 315,000 *additional* pieces produced.

Now consider these other Carboloy Cemented Carbide benefits: Closer tolerance on drawn parts —fewer" rejects"—lower cost per piece—virtually mirror-smooth finish, often with reductions in buffing time—and sizeable increases in output-per-press. You get more money, more production and less costs with CARBOLOY Sheet Metal Dies.

Carboloy Company Inc., 11153 E. Eight Mile Road, Detroit 32, Michigan.

START THE BALL ROLLING TODAY—WRITE FOR BOOKLET D-120

CARBOLOY® CEMENTED CARBIDE

SHEET METAL DRAWING AND BLANKING DIES

West Coast . . .

ROBERT T. REINHARDT

• Ford parts buying on Coast is increasing . . . Eagle Mountain ore test run looks good . . . Washington state Labor Federation has lively convention.

LOS ANGELES — Ford Motor Co. has awarded 24 new contracts to California manufacturers to supply automotive parts under its $50 million a year West Coast purchasing program. These contracts, placed within 10 days, are evidence of rising interest and cooperation of West Coast manufacturers, and give strong promise of the success of Ford's West Coast purchasing program, according to Lou C. Disser, purchasing representative on the Coast.

Progress made in June is expected to cut previous estimates of the length of time it would take to set the plan in full operation by several months, Disser point out. Two years had been given as an estimate of the time it would require California manufacturers to be mass-producing, but Disser felt this schedule would be speeded up.

Ford's established suppliers on the West Coast are already producing $22 million worth of parts for the company. The business contemplated by the new program is in addition to the $22 million.

Negotiations are now being carried on with a large number of firms. The following concerns are expected to receive contracts as Ford's suppliers in the near future, Disser said: Harris Mfg. Co., Stockton; Harvill Corp., Acme White Lead, General Metals Corp., Ace Foundry, Ltd., all of Los Angeles; Pacific Div. Bendix Aviation Corp., North Hollywood; Warner Mfg. Co., Glendale; Arcturus Mfg. Co., Inc., Burbank; Reeves Rubber, Inc., San Clements; Rohr Aircraft Co., Chula Vista; and Solar Aircraft Co., San Diego.

Contracts have already been signed between the Ford Motor Co. and the following manufacturers in the Los Angeles area: Oliver Processing Co.; Kirkhill Rubber Co.; Plastic & Rubber Products Co.; Elmore Engineering Co.; Apco Mfg. Co.; Cash Sales Store; and Automotive Parts Co.

IN the San Francisco area three companies have signed contracts with Ford: Goodyear Rubber Co., Oliver Tire & Rubber Co., and the R. N. Nason Co.

While the initial flood of enthusiasm upon the part of potential manufacturers of parts for Ford on the Coast has been somewhat checked by the lack of familiarity with mass production methods and in some cases material shortages, there is enough evidence at hand to indicate that Mr. Disser's optimism is justified. Apparently the largest hurdle to be overcome in negotiating satisfactory contracts is the education of some of the smaller manufacturers in mass production methods and techniques.

Many initial quotations to the Ford Co. were so ludicrously out of line that purchasing agents carefully investigated many of them and found that in most cases the costs were based on small lot production and that but few, if any, mass production techniques, long considered standard in the East, had been considered. As an example, one manufacturer of a small metal part offered it to Ford at approximately twice what that company was presently paying in the East. Investigation showed that actual production of the part in the metalworking end was entirely in line but that the absurdly high price was brought about because the manufacturer anticipated sending the parts out for hand painting. Ford purchasing agents quickly pointed out how this part of the job could be done economically and with a relatively low investment in the fabrication plant and put the product's delivered price well into competition with eastern producers.

In the awards of contracts at the present time there is a notable absence of steel products which probably is not to be unexpected in the light of the present tight steel supply nationally and especially on the West Coast for sheets and specialty items.

The Rheem Mfg. Co. has also been reported as negotiating with the Ford Motor Co. for the production of parts. Rheem purchased the Fraser Furnace Co. at Stockton, Calif. recently and is intending to discontinue furnace production there and ship the machinery, dies and other equipment from Stockton to Chicago for furnace production there. It is believed that negotiations with Ford are designed to bring about utilization of the Stockton facilities which will probably be available within a few months.

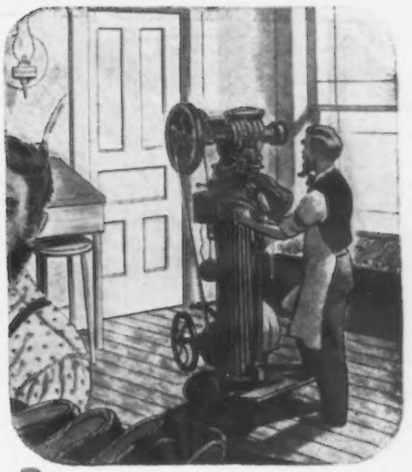
IF recently completed tests of Eagle Mountain ore conducted at the Kaiser Co., Inc. blast furnace at Fontana are completely representative, it appears that this independent producer will be in a position to mine and deliver ore at the blast furnace at a Fe unit cost

Results of Eagle Mountain Ore Tests

		June 16 to June 27	Entire Run June 10 to 27
Eagle Mountain Ore in burden	pct	84.9	78.4
Scrap charged	lb per net ton	0	0
Daily production	net ton	1243	1233
Coke consumption	lb per net ton	1437	1451
Flue dust production	lb per net ton	27	31
Wind blown	cfm	60,000	60,000
Coke ash	pct	10.1	10.1
Coke sulphur	pct	.98	.99
Blast temperature	deg. f	1163	1173
Blast pressure	psi	16.7	16.2

1 1851—John Nichols, a Lynn Shoemaker, adapted the Howe sewing machine to sew the uppers of shoes, doing away with the slow process of hand sewing. This started a fever of invention and innovation in the shoe industry in America that has carried to the present day.

2 1858—Lyman R. Blake, of South Abington, Mass., invented a machine to sew soles to uppers. This was subsequently improved by Robert Mathies and manufactured by Gordon McKay. It became famous as the McKay sewing machine . . . set the stage for more progress.



3 1862—Goodyear Welt Machine ushered in the third stage. In 1890, electric motors arrived. By 1915—Howell began specializing in industrial type motors. Soon, Howell Red Band Motors, specially designed for application in this and other industries, made their appearance.

Three stages to big business in shoes!

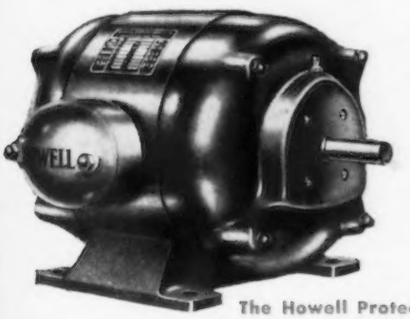
4 Today—The shoemaker's kids have shoes! America is the biggest producer of shoes in the world.

The application of specially designed machines, individually powered with industrial type electric motors, has played a vital role in stepping shoemaking into big business . . . improving quality . . . cutting costs.

You can work wonders in your business, too! Investigate now and remember Howell Motors are tried and proved industrial type motors. They are precision-built and designed for the toughest operating conditions—consequently, they will perform better on all jobs.

Try them NOW!

Be wise—meet competition with modern machines powered by industrial type Howell Motors. They're precision-built!



The Howell Protected Type Motor

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Manufacturers of Quality Industrial Type Motors Since 1915

equal to or lower than corresponding cost for any other ore delivered at any other plant in the country.

The test was conducted between June 10, when a small amount of Eagle Mountain ore was introduced into the blast furnace, and was continued through June 27. Charges were gradually increased to 80 pct of either raw ore or sinter produced from the ore and eventually, or 2 days, 100 pct Eagle Mountain ore constituted the burden. Approximately 30,000 net tons were run through the furnace. The significant average figures developed during the run are shown in the accompanying table.

According to an analysis of the ore mined for the test and provided by the company, it ran Fe 53.91 pct; phosphorus .031 pct; manganese .05 pct; silicon oxide 8.21 pct; aluminum oxide 2.45 pct; calcium oxide 1.69 pct; magnesium oxide 3.15 pct; and sulphur .293 pct.

Reportedly, there are approximately 25 million net tons of ore in the deposit from which this sample was taken which, it is anticipated, will last the Fontana operations for approximately 40 years at the present rate of consumption. Test spot borings throughout the area surrounding this deposit indicate an additional deposit which might exceed 70 years' supply.

Completion of the 52-mile long access railway to Eagle Mountain is scheduled for April of 1948 when it is anticipated that full scale ore production will be under way.

SEATTLE—Conduct and behavior of delegates to the 45th annual convention of the Washington state Federation of Labor last week diverged from parliamentary procedure and at times entered the realm of fisticuffs as the Taft-Hartley Act and the left-wing element became whipping boys.

Federation president E. M. Weston strongly urged the delegates to openly defy the newly enacted labor legislation. He stated:

"We are not going to respect provisions of the Taft-Hartley Act which we know were designed to crush the labor movement. Passage of the act is going to make us go out and practice some good old trade unionism. Organized labor's insistence upon buying only union label goods will be as effective as any secondary boycott forbidden by the labor act."

As was to be expected, Harry Cain, R., Washington state junior senator, came in for a thorough verbal thrashing. Mr. Weston said:

"Cain has double-crossed the labor movement and just about everyone else except the Real Estate Boards." This latter reference undoubtedly was made because of the unfavorable labor reaction to Mr. Cain's proposed housing bill.

Welders Union Local 501 has charged that Cain "has proven to be a friend of the well financed few and an enemy of ours," because of his support of the labor bill. The organization is working for Mr. Cain's immediate recall.

Left wingers came in for censure when Mr. Weston refused press credentials to a reporter for the *New World,* leftist Seattle weekly paper. This started some minor fireworks which culminated in a general brawl among scores of delegates which resulted in one man going to the hospital.

Commenting on the leftist angle, Mr. Weston said, "The *New World,* the Congress of Industrial Organizations and the Communists double-crossed the Federation's labor program in the last session of the state legislature and the teamsters (who withdrew from the Federation several years ago) were in on it. The state Federation came through and whipped the pants off of them and they can't take it now."

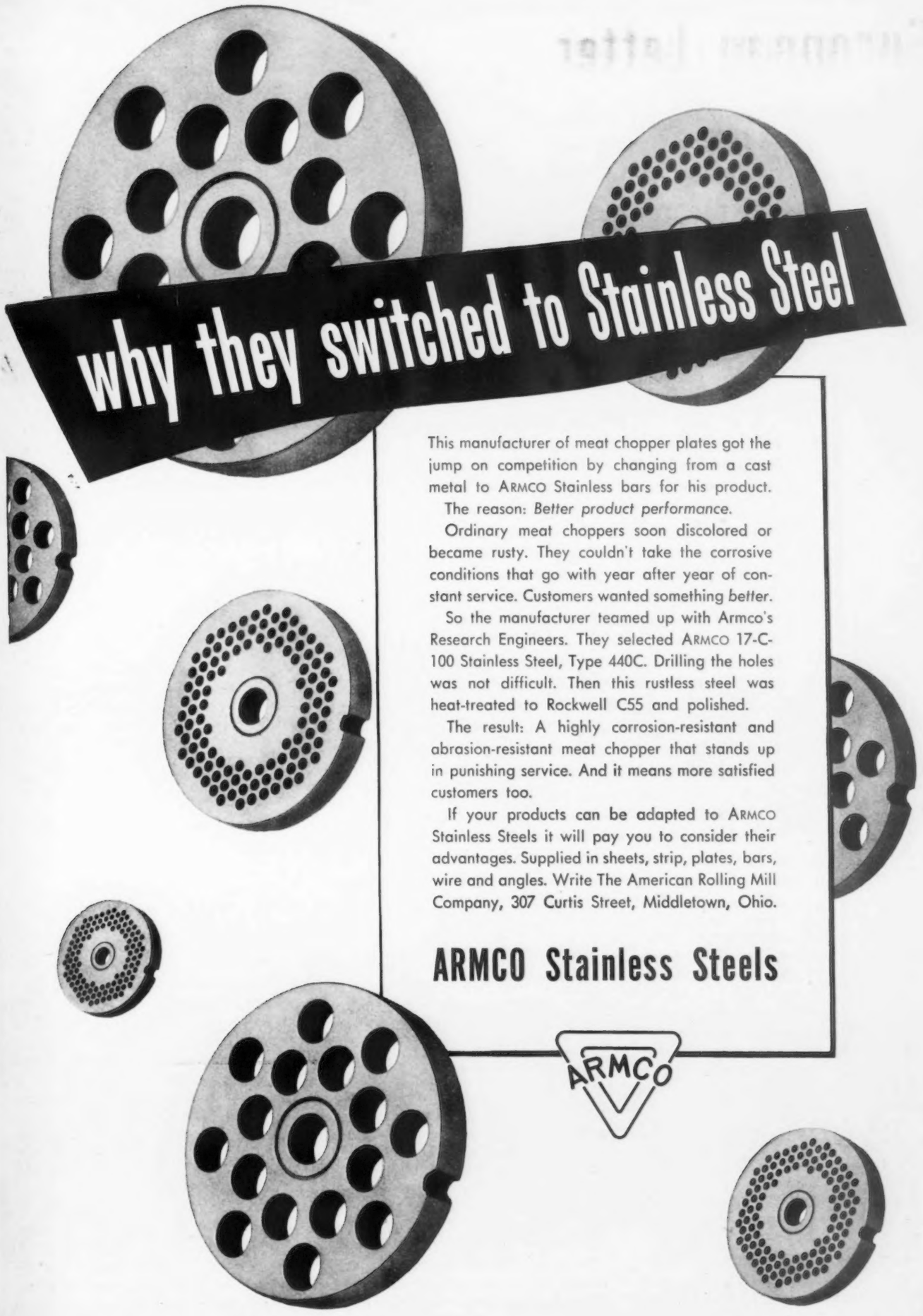
Charges were made that the left wingers had been making "spasmodic attempts to stalemate the convention," and the general fight started when one delegate booed the speech of another.

Among the major accomplishments of the convention were: A resolution favoring a statewide minimum salary schedule for school teachers and favoring extension of compulsory school attendance to age 18 or until high school is completed; making up of plans to fight the Taft-Hartley labor bill; tentative approval of the establishment of a Washington office to represent the 11 western Federations; and last but not least, a style show which featured union made goods.

SALT LAKE CITY—To say that operators of commercial coal mines in Utah are "put out" about the terms of the new contract with the United Mine Workers and the way it was reached is an understatement. They object to the use of the term "negotiated" because they say they were neither present nor informed as to terms when the agreement was made. One spokesman commented that "negotiation" will continue to be a glaring misnomer until the captive and commercial mines are completely separated.

Nonferrous metal mine operators feel that the Lewis coal contract has put a new obstacle in the way of a wage settlement with the International Union of Mine, Mill & Smelter Workers. They say the increase given to the coal miners has stiffened the spines and possibly raised the sights of the metal miners.

TELLING THE WEST: *Bethlehem Pacific Coast Steel Corp. is using this exhibit in the West to inform industrialists about the company's operations in that area which now include: four shipbuilding yards, three steel plants, three fabricating works, three bolt and nut plants, four mill depots and 10 oil field supply stores. Total average employment of the company on the West Coast for the past year has been 14,000, with $37 million paid out in wages and with total purchases of materials and services amounting to $43 million.*



why they switched to Stainless Steel

This manufacturer of meat chopper plates got the jump on competition by changing from a cast metal to ARMCO Stainless bars for his product.

The reason: *Better product performance.*

Ordinary meat choppers soon discolored or became rusty. They couldn't take the corrosive conditions that go with year after year of constant service. Customers wanted something *better.*

So the manufacturer teamed up with Armco's Research Engineers. They selected ARMCO 17-C-100 Stainless Steel, Type 440C. Drilling the holes was not difficult. Then this rustless steel was heat-treated to Rockwell C55 and polished.

The result: A highly corrosion-resistant and abrasion-resistant meat chopper that stands up in punishing service. And it means more satisfied customers too.

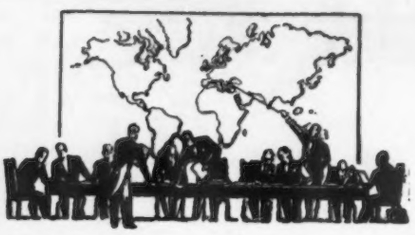
If your products can be adapted to ARMCO Stainless Steels it will pay you to consider their advantages. Supplied in sheets, strip, plates, bars, wire and angles. Write The American Rolling Mill Company, 307 Curtis Street, Middletown, Ohio.

ARMCO Stainless Steels

ARMCO

European Letter . . .

• MacArthur calls for a treaty with Japan within a year from now . . . Economic revival is a protection against communism.



LONDON—"That is causing us to think very hard and very deep," said Mr. Bevin, speaking in London on July 8, about the problem of making a peace treaty with Japan. It is now generally agreed that a peace conference for Japan will precede any which may ever be held for Germany. General MacArthur has called for a treaty within a year from now, Australia is also pressing for an early settlement, and Commonwealth discussions on the subject are to be held in Canberra next month.

Japan is in the same category as the European satellite nations with which peace has already been made, in so far as it has a single recognized government—and is unlike Germany, which has no central government and no prospect of having one in the near future. Japan is free, moreover, from the special complications arising from the zonal division of Germany; for the authority of General MacArthur as Allied Supreme Commander extends over the whole country.

This does not mean that the making of peace with Japan is going to be an easy matter or that the fate of Japan does not confront the victors of the Pacific war with an acutely difficult problem. If Japan has escaped the political disintegration of Germany, its economic plight is quite as serious and its position as an object of rivalry between Russia and the United States is very similar.

From the British point of view the international situation with regard to Japan can give rise in some respects to even greater anxiety, for whereas in Germany Anglo-American cooperation has been obtained to a high degree and is a great factor of stability, in the Pacific the friction between the United States and Australia renders it much more difficult to reach a good understanding between London and Washington.

IT IS the economic situation in Japan which, more than anything else, is making a settlement in the Pacific a matter of urgency. This situation is becoming more and more acute as Japanese industry uses up the last of the fairly large stocks of raw materials which were left in Japan on VJ day and, being no longer required for war purposes, could be turned over for civilian production.

It is these stocks which, by rendering possible a limited temporary industrial recovery, concealed for a while the economic ruin which had overtaken the country. When the stocks were exhausted, Japan had no means to replenish them and the extreme poverty of its own natural resources was starkly revealed.

There should, of course, have been nothing surprising in this, for the basic facts of Japan's industrial development were well known to experts on the subject. But in the hour of victory those who made the decisions on the allied side saw only the war potential which had made it possible for Japan to strike so dangerously in December 1941, and which must therefore be abolished by every possible means.

Reprinted from The London Economist by special permission.—Ed.

Those were the days when eminent public personages talked of the "pastoralization" of Germany and Japan, and an allied general announced that the defeated enemy would get just enough relief from famine "so that their rotting corpses don't infect our troops." Apart from the resolve to obtain future security by "deindustrializing" the enemy, there were powerful economic motives in operation: On the Russian, French and Chinese side mainly to obtain capital re-equipment and supplies by means of reparations, on the British and American side to eliminate German and Japanese commercial competition for the future. So all the emphasis was negative and destructive, on completing the havoc which the bombers had already carried so far.

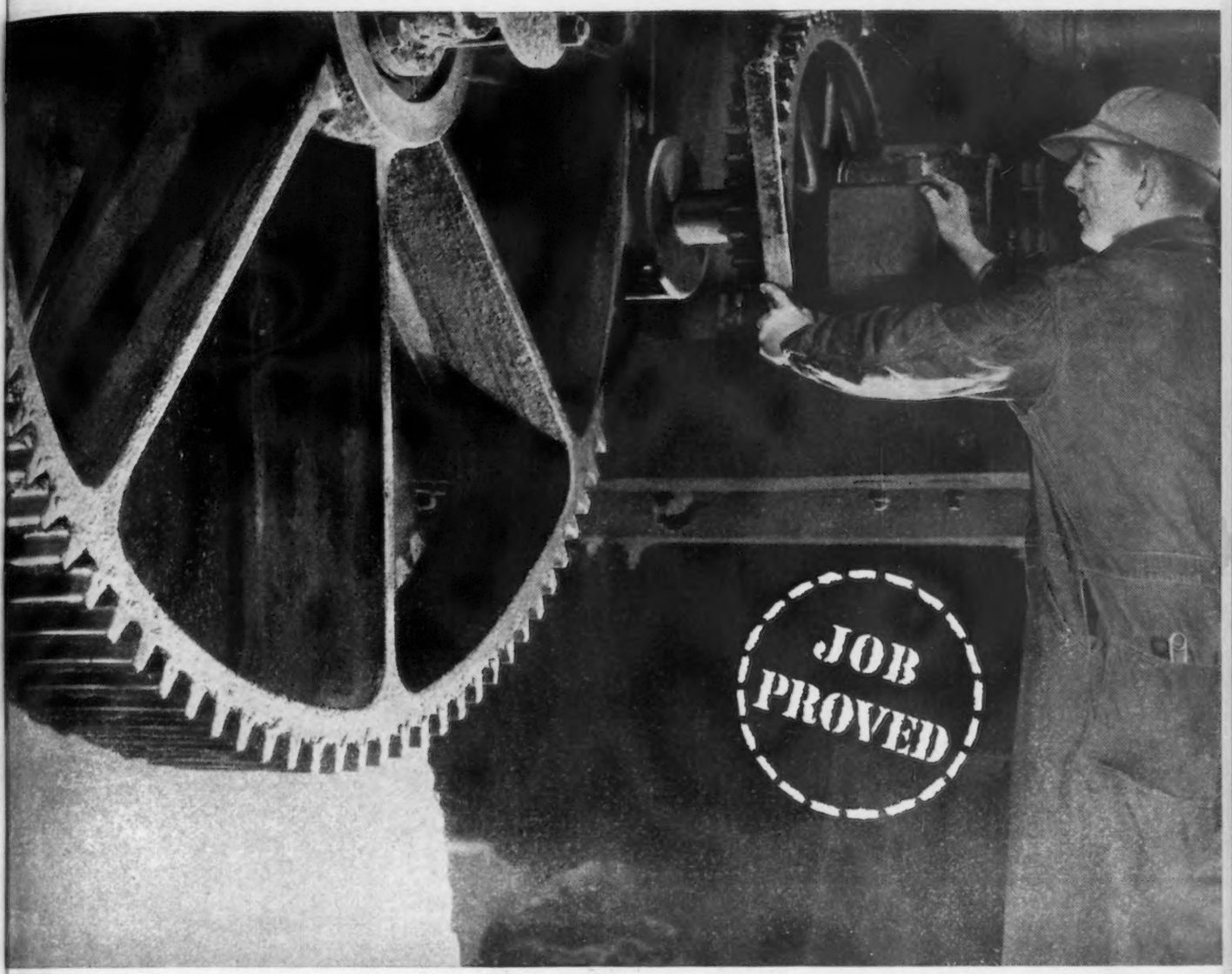
A change of mind was bound to come. Once military administration was instituted and allied governments became responsible for the territories under their control, it gradually became clear that a certain minimum of economic life must be maintained. It was not seriously proposed to exterminate the conquered peoples; therefore they must have enough food to sustain life. Moreover, the occupation forces themselves largely depended on local supplies and public utilities; they had an interest, therefore, in preventing a complete economic breakdown.

But soon it was found that the minimum required to keep things going involved imports which the defeated countries were no longer able to pay for by export trade and which the victors had to provide out of their own revenues.

Thus the deficit economies of Western Germany and Japan became charges on the British and American taxpayer—a state of affairs which aroused a lively discontent, especially in the less long-suffering beast of burden on the western side of the Atlantic. By a force of logic which even ex-pastoralists had to admit, it came to be accepted that the enemy economies, if they were to pay their way, must no longer be demolished, but on the contrary rebuilt.

THIS conclusion has been reinforced by considerations of another order. The danger of infection from rotting corpses is no longer the only cause of apprehen-

Sinks its Teeth into a 50% Saving



SUN GEAR LUBRICANT...

Clings to Gear Teeth, Lasts Longer, Helps to Cut Lubrication Costs

A well-known New England mill had a chronic maintenance problem in the lubrication of a big gear train. Messy, black gear compounds were being used. They were hard to apply and didn't stay on.

To correct this situation a Sun Engineer was called. After checking all the factors involved, he recommended an extra heavy Sun grease with special adhesive properties.

A saving of 50% in lubrication costs has been effected since the Sun grease was adopted. The Sun product lasts longer, adheres to the gears and does not dirty up the mill.

"Job Proved" Sun lubricants are making records like this in scores of mills and factories in many parts of the country. They are helping to cut operating costs, to end maintenance headaches, and to keep machines in first-class condition. For full information and practical advice on lubrication, call your nearest Sun Engineer. Or write Department IA-7.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

In Canada: Sun Oil Company, Ltd.—Toronto and Montreal

SUN

SUNOCO

INDUSTRIAL PRODUCTS

sion to the victors from misery and starvation in defeated countries; there is concern also about the minds of the former enemy nations.

As long as it appeared that the victors were united, it was plain that the defeated and disarmed peoples were powerless to resist the force which controlled and it did not seem to matter what they thought or felt. But, as the great rift between Russia and the Western Allies became daily more visible to all, the political sentiments of the conquered were also seen to have some importance.

It also began dimly to be appreciated in London and Washington that in a competition for political influence the advantage under existing conditions lay with Russia. Breakdown of the economic order was liable to turn the masses towards communism, and if and when Communist rule was established, its dictatorial methods of government would enable it to defy unpopularity. But to give stability to a multiparty parliamentary democracy and avoid violent revolutionary upheaval a certain vitality of the body economic, if not a condition of definite prosperity, must be maintained.

It is now a commonplace of argument in America in support of aid to war-wrecked countries, whether allied or ex-enemy, that economic revival in each case is a prophylactic against communism. Japan is no exception to this principle; economic aid is seen as a means of giving it internal political stability and at the same time keeping it within the American rather than the Russian orbit after the withdrawal of American occupation forces.

IF AMERICAN aid to Japan is not to be a continuing subsidy, as it is now, and is to make Japan solvent within a term of years, it must be on a very large scale. Japan's modern industry has been highly artificial in the sense that it has been built up on a very slender base of homeland fuel and raw materials. Japan has evolved an economy exceptionally dependent on imports both of foodstuffs and raw materials.

The population has more than doubled in three quarters of a century and, even though the birthrate is gradually falling, there will be a considerable natural increase over the next 20 years. No great expansion of food production in the homeland is possible, and now that Korea and Formosa have been lost their food supplies are not available to supplement Japan's own production except through foreign trade.

Moreover, in Japan as elsewhere, figures of total food production capacity cannot be taken as actual because the farmer himself is not an automatic machine; he depends on incentives. The altruistic farmer is as rare a species in Japan as in Germany, France, Britain or America. If the towns can give him nothing in exchange for his produce except a fixed price in paper money which will not buy any goods, he does not see why he should work to feed the towns, or if he does sell, it will be by barter in the black market where something of value can be obtained in return.

In Japan there has long been a marked animosity between the countryside and the towns and today the Japanese farmer tends to regard the unproductive town-dweller as a parasite. Feeding the poorer classes in the towns has become a major problem for the government and not until there is an adequate supply of industrial consumers' goods can it be fully solved even as regards home-grown foodstuffs; any coercion of the farmers not only requires a large police force but is politically dangerous for the party which attempts it.

If Japanese industry is unable to produce enough goods to induce the farmer to part with his harvest at controlled prices, still less can it now compete in foreign trade to provide Japan with essential imports.

Japanese export trade was built up first on raw silk, and secondly on a wide range of light industries in which cotton and rayon textiles were most conspicuous; over the decade before 1941, and of course especially during the war, there was a development of heavy industry, which was mainly used for armaments and the capital equipment of Korea and Manchuria, but could theoretically provide civilian goods for export now that Japan has been disarmed.

Today Japanese raw silk has only very limited prospects because of the competition of nylon; industrial plant, both heavy and light, has been greatly reduced by bombing and what remains is mostly worn out or obsolete; raw material stocks have been used up; and, as nobody knows what will be the future permitted level of industry or how much plant will in the end be taken for reparations, there is little inducement to invest in such capital improvement as is possible.

JAPAN'S principal assets at present in seeking economic aid from America are first that the country has a unified and orderly state administration, and secondly that the Japanese have had a good reputation in the past for payment of debts and for efficiency of business administration.

Japan has gained greatly by contrast with the chaotic condition of postwar China, and there is a strong disposition in America to regard it as altogether a safer proposition for American money. Meanwhile a peace treaty is desirable at an early date in order that the level of industry may be definitely fixed, that the American army of occupation (now a major charge on the Japanese budget) may be withdrawn and that the question of the American "strategic frontier" may be settled without further delay.

There is indeed attraction for Americans in the idea of a disarmed Japan, rescued from feudalism and converted to democracy and Christianity by General MacArthur, protected against perils from the mainland by the loving care of American air power from bases not too remote, and paying its way as the American-financed workshop of Asia in ways which would not threaten conflict with American interests.

The trouble is that some other nations, for various reasons, find less pleasure in this picture. Russia does not relish the thought of Japan as a permanent American satellite adjacent to the coast of Siberia, and many a spanner may yet be thrown into the works from Moscow.

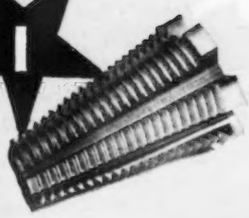
Nor do the countries which suffered most from Japan's prewar trade expansion like the idea of its renewal as a subsidiary concern of the United States. There will indeed be plenty to talk about when it comes to peacemaking with Japan and it is good that the Foreign Secretary has recognized the need for "very hard and very deep" thinking on the subject.

5 Star FEATURE

of the MACHINE TOOL SHOW

Be sure to see Continental's display of standard and special cutting tools when you visit the Machine Tool Show at the Dodge-Chicago Plant, September 17 to 26. Continental Tool Works, a division of Ex-Cell-O Corporation, has been designing and manufacturing cutting tools for American industry for 28 years. Watch Continental's precision-made cutting tools in action on metal-working machines when you visit the Ex-Cell-O booth (No. 518) at the Chicago Show.

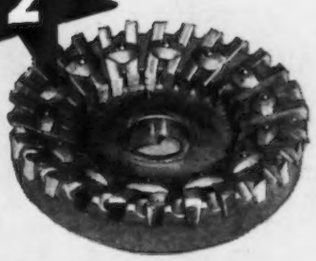
1



CONTINENTAL THREAD MILLING CUTTER

This special thread milling cutter was made by Continental for milling carbon electrodes.

2



CONTINENTAL FACE MILLING CUTTER

This standard cutter has blades placed either radially in the face of the cutter body or in the periphery of the body.

3

CONTINENTAL CARBIDE-TIPPED CUTTERS

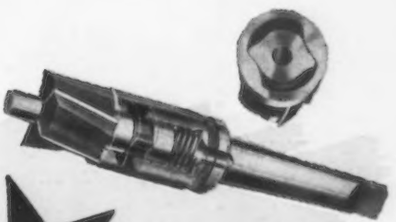
Roughing and finishing doming cutters for aircraft cylinder heads.

4

CONTINENTAL PRECISION BROACH

Involute Spline Broach. Continental makes all kinds of round, square, rectangular, spline and insert-type broaches.

5



CONTINENTAL INTERCHANGEABLE COUNTERBORE

Continental's famous counterbore with balanced indestructible drive. Toolroom counterbore sets—in three sizes (See them at the Show.)

CONTINENTAL TOOL WORKS
CTW
EX-CELL-O CORPORATION

47—27

MORE GOODS FOR MORE PEOPLE AT LOWER COST

CONTINENTAL TOOL WORKS

DIVISION OF EX-CELL-O CORPORATION

DETROIT 6, MICHIGAN

PERSONALS

RICHARD M. PAXTON, JR., vice-president, Jessop Steel Co.

• **Richard M. Paxton, Jr.** has been elected a vice-president of the Jessop Steel Co., Washington, Pa. Mr. Paxton joined the Jessop Steel Co. in 1924 and has served in various capacities in all of the company's production departments and laboratories. In 1927 he was transferred to New York, where for the past 20 years he has been in charge of Jessop's New York branch office.

• **Berton H. DeLong** has been appointed vice-president and technical director and **George B. Luerssen** has been appointed to the post of chief metallurgist of the Carpenter Steel Co., Reading, Pa. Mr. DeLong has been with Carpenter since 1910, and before his recent promotion, held the office of vice-president and chief metallurgist. Mr. Luerssen has been associated with Carpenter since 1907, and prior to his promotion, held the post of assistant chief metallurgist.

• **John F. Cunningham, Jr.** has been appointed manager of the J. P. Devine Mfg. Co. plant at Mount Vernon, Ill., a subsidiary of H. K. Porter Co. Inc., Pittsburgh. Mr. Cunningham formerly was research engineer and manufacturing division engineer for the Elliott Co., Jeannette, Pa.

• **Timothy L. Sullivan** has retired from his position as foreman after 52 years continuous service with the Pittsburgh plant of Federated Metals Div., American Smelting & Refining Co.

• **D. W. Frease** has been elected president of the Empire Steel Corp., Mansfield, Ohio, and **James Hill** has been named chairman of the board. Mr. Frease has been operating vice-president of the Reeves Steel & Mfg. Co. and replaces **Joseph E. Montgomery, Jr.,** who has resigned. Mr. Hill served as chairman of the board until 3 years ago when he retired to a temporary advisory position.

• **Frank J. Shanaberg** has been named eastern district sales manager, American Welding & Mfg. Co., Warren, Ohio. Mr. Shanaberg joined American Welding in 1943, as manager of product development, later being named sales promotion manager. Prior to his association with the company he was for 4 years assistant to the manager of product engineering department, Steel & Tubes Div., Republic Steel Corp.

• **Onni Lindfors,** who has been in the past a design engineer in the electrical division of Fairbanks, Morse & Co., Beloit works, has been appointed chief electrical engineer of the company's Freeport, Ill. plant.

• **J. H. Donahue,** newly-appointed general sales manager of Pioneer Steel Ball Inc., Unionville, Conn., has been elected secretary of the corporation.

• **Mrs. Thomas S. Hemenway** has been elected chairman of the board, president and treasurer of the Metal & Alloy Specialties Co. Inc., Buffalo, to succeed her late husband. **Richard A. Stockton** has been promoted to general manager and will direct plant operations. **Robert A. Dillon,** president of the Lake Erie Engineering Corp., and **Keith Williams,** president of the Pratt & Letchworth Co., have been added to the board.

• **Owen G. Watterman** has been appointed sales manager, Zagar Tool, Inc., Cleveland. Mr. Watterman, who has been affiliated with Zagar for the past 6 years, comes to his new position from the engineering department.

EDWARD L. STOCKDALE, president, Universal-Cyclops Steel Corp.

• **Edward L. Stockdale** has been elected president of Universal-Cyclops Steel Corp., Bridgeville, Pa. He succeeds the late Walter H. Baker. Mr. Stockdale has held various executive positions with Universal-Cyclops for 33 years and has been executive vice-president for the past 10 years.

• **Allan B. Kime** has been appointed eastern regional manager in charge of the sale of positioning and turning roll equipment of Ransome Machinery Co., a subsidiary of Worthington Pump & Machinery Corp. Mr. Kime has been associated for the past 12 years with the Federal Shipbuilding & Drydock Co. His eastern regional headquarters will be at the Ransome plant, Dunellen, N. J.

• **J. Clyde Campbell** has retired from Youngstown Sheet & Tube Co. industrial relations department, Youngstown, ending 52 years in the steel industry. In 1895 he began working for the Mahoning Valley Iron Co. He joined Republic Iron & Steel Co. when it was organized and a few years later he joined Carnegie Steel Co. and later joined Youngstown Sheet & Tube Co.

• **Edmond B. Hollingsworth** has been named to the new position of assistant production manager of the National Gypsum Co. with headquarters in Buffalo. He will be succeeded as manager of the company's York, Pa. plant by **William W. Wallace.**

• **Frank T. Clarke** has been appointed director, cold rolled strip sales in the general sales department, American Steel & Wire Co., Cleveland. **Edward B. Erickson** has been named special sales representative of the general sales department in Washington, succeeding Mr. Clarke. Mr. Clarke has been associated with American Steel & Wire Co. since 1921, when he began as an office assistant in the Boston warehouse of the company and was made assistant manager of manufacturers products department in the New York office in 1940. Since 1942, he has held the position which he now relinquishes. Mr. Erickson comes to American Steel & Wire from a private practice as consultant for industry with reference to governmental controls. From 1942 to 1946 he was in government service, having served during the last 3 of those years as chief of priorities section of the U. S. Maritime Commission. **Banks E. Eudy** has been appointed director, stainless steel sales, in the manufacturers products sales division of American Steel & Wire Co. He was previously district sales manager for Allegheny Steel Co. in Cleveland for 8 years before becoming associated with Carnegie - Illinois Steel Corp. in 1936, as district representative of the stainless steel division, which position he relinquishes to assume his new duties with the Wire company.

• **Paul Rhodes** has been appointed new purchasing agent for the Hyster Co. at the Portland, Ore., main office. He has been with the company since 1945, working in coordinating and expediting of materials in the Chicago office of the Hyster Co.

• **Chester L. Jones, Jr.,** manager of production development at the Monsanto Chemical Co.'s Springfield, Mass. plant, has been made sales manager of the protective coatings department at Everett, Mass.

• **Henry W. Creeger** has been appointed field engineer in Houston for Electro Refractories & Alloys Corp., Buffalo. Prior to his service in the war, Mr. Creeger represented the company in Los Angeles.

S. R. IVES, president, Armco Drainage & Metal Products, Inc.

• **S. R. Ives** has been elected president of Armco Drainage & Metal Products, Inc., Middletown, Ohio. **M. C. Patton** has been elected executive vice-president of this American Rolling Mill Co. subsidiary, and **H. D. Neill,** vice-president in charge of sales. Mr. Ives and Mr. Patton have also been elected president, and executive vice-president respectively of Armco Drainage & Metal Products of Canada, Ltd. Mr. Ives joined the company in 1917 as a foreman in the annealing department of the East Works plant. In 1920 he was a salesman for Armco and since that time he has held important sales and management positions. He has been vice-president and general manager of AD&MP, Inc., since 1945. Mr. Patton's first connection with the company came in 1926 as an engineer with the Armco Culvert Manufacturer's Assn. In 1933, he was chief sales engineer of the former Culvert & Pipe Sales Div. of the American Rolling Mill Co. In 1939 he became assistant manager of the Pipe and Formed Products Sales Div., and assistant general manager of Armco Drainage & Metal Products, Inc., in 1945. Before this advancement he was vice-president and assistant general manager of AD&MP, Inc. Mr. Neill joined the American Rolling Mill Co. in 1926. He was connected with the employment department and industrial engineering department of the Middletown Div. until 1933 when he became a salesman of Culvert & Pipe Sales Div. He was advanced to assistant to general manager of Armco Drainage & Metal Products, Inc. in 1944.

• **Arthur A. Heuer** has been appointed sales manager of the furniture division of the Barcalo Mfg. Co., Buffalo. He has been with the company since 1921.

• **Milton L. Seckel** has been appointed district sales representative in western New York for Fort Duquesne Steel Co., Pittsburgh. Mr. Seckel was associated with Otis Steel Co., Cleveland, from 1934 until 1940 and more recently with Wheelock, Lovejoy & Co. Inc., and Brace-Mueller-Huntley, Inc.

• **Frank F. Chiles** has been made manager of the Cincinnati sales office of S. A. Richardson & Associates. He was formerly sales manager, Andrews Steel Co.

• **Douglas Hamilton** has resigned from Carnegie-Illinois Steel Corp. to become president of the Utility Products Co., Butler, Wis. Prior to representing Carnegie-Illinois in Milwaukee, Mr. Hamilton was a salesman for Jones & Laughlin Steel Corp. in New York.

• **J. D. Quinn** for a number of years assistant general manager of Franklin Steel Works, Franklin, Pa., has become associated with Jersey Shore Steel Co., Jersey Shore, Pa.

• **George E. Dewey** has been appointed general personnel director for Pittsburgh Plate Glass Co., Pittsburgh. He had been associated with the Standard Oil Co. of Indiana for 17 years. **George D. McClaren,** associated with the firm's industrial relations department during the past 3 years, will serve as assistant general personnel director.

• **George L. Sharpe,** former sales and service manager of Michigan Tool Co., has joined the American Cutter & Engineering Corp., Warren, Mich., in a similar capacity.

• **Col. A. E. Higgins** has been named vice-president of the Rockwell International Corp., New York. He has recently retired from the Army. Prior to the war he had been associated with the Rockwell organization from 1937 to 1942.

• **George F. Cronmiller, Jr.** has been elected secretary of Harbison Walker Refractories Co., Pittsburgh. Mr. Cronmiller came to Harbison Walker in 1913 and has been assistant secretary for the past 26 years. He succeeds **P. R. Hilleman,** who has retired after 55 years' service. **Theodore Hoover, Jr.** has been appointed general traffic manager. Mr. Hoover has served in the traffic department since 1927 and has been assistant general traffic manager since 1946. He succeeds **F. M. Ewing,** who has retired after 47 years' service. **Robert R. Miller** has been appointed advertising manager. Mr. Miller, who has served 19 years in the export department, succeeds **E. B. Guenther,** who is retiring after a service of 32 years. **E. M. Sarraf** has been appointed district sales manager in the Cleveland district, to succeed **R. P. Balph.** Mr. Balph is retiring after 41 years of service. Mr. Sarraf has had 21 years of service.

• **A. W: Baird,** who has been assistant purchasing agent of the National Supply Co., Pittsburgh, since 1944, has been appointed purchasing agent for the company's Spang-Chalfant Div. **J. M. Taylor,** who has been in the purchasing department of the company since 1945, has been appointed assistant purchasing agent of the Spang-Chalfant Div.

• **Fritz Bronner,** export manager of Ekco Products Co., Chicago, has been elected to the newly-created position of vice-president and general manager of Ekco Products Co., Ltd., of Montreal.

• **I. J. Terkelson,** field engineer for SKF Industries, Inc., has been transferred from Chicago to the Milwaukee sales office.

D. F. WENZEL, manager of sales, Wisconsin office, Globe Steel Tubes Co.

• **D. F. Wenzel** has been appointed manager of sales of the Wisconsin office of Globe Steel Tubes Co. Mr. Wenzel will headquarter in Milwaukee. He has been associated with Globe Steel Tubes Co. for the past 11 years in the general sales office and replaces **T. R. Coffey** who has been transferred to the Detroit office as manager of sales.

• **William Ludvik** has been named president and general manager of the McAlear Mfg. Co., Chicago.

• **E. E. Richards** of Studebaker Corp., South Bend, Ind., has been appointed treasurer. **Paul M. Clark** has been named secretary, and **A. J. Porta,** comptroller of the corporation. **Ralph A. Vail,** vice-president in charge of manufacturing; **A. G. Rumpf,** secretary-treasurer; **H. E. Dalton,** comptroller, and **J. F. Cotter,** general attorney, are retiring. Mr. Cotter will continue as a director. Mr. Richards joined Studebaker in 1941. Mr. Clark joined the company in 1940 and handled its war contracts. Mr. Porta has been with Studebaker since 1925, and for the past 2 years he was comptroller of Studebaker Pacific Corp.

• **W. R. Becker** has been appointed product promotion manager for General Electric Co.'s wiring device sales, Bridgeport, Conn. Mr. Becker came to General Electric's accounting department in 1937. He subsequently joined the sales training course, and in 1942 came to the wiring device sales division. For the past year, he has served as a district representative on wiring devices in Kansas City. **James A. O'Donnell** has been appointed district representative for General Electric conduit products in the Great Lakes district with his headquarters in Cleveland. Mr. O'Donnell served in the Navy for 10 years. After the war, he was employed by the General Electric Supply Corp. in Cincinnati and Dayton.

• **James R. Weaver,** works manager, East Springfield works, Westinghouse Electric Corp., has been made a director of Wico Electric Co., Springfield, Mass.

• **Harold B. Moran** has been appointed steel buyer for the International Harvester Co. at the general office in Chicago. Mr. Moran was formerly sales representative with Wisconsin Steel Div. of Harvester, and he succeeds **David C. Young,** who has resigned.

• **Basil Fenn-Anstruther** has been appointed representative of Iron & Steel Products, Inc., in California, Nevada and Arizona, with headquarters in Los Angeles.

...OBITUARY...

• **Harry W. Magee,** for many years a sales representative in the Philadelphia territory of American Equipment Div. of Pittsburgh Screw & Bolt Corp., Norristown, Pa., died July 7.

• **Alden C. Cummins,** general superintendent of the Youngstown plant of Carnegie-Illinois Steel Corp. since 1940, died July 10. He was with Carnegie-Illinois for 36 years.

• **George H. Paterson,** 58, production engineer for the Sterling Engine Co., Buffalo, died July 8. He had been with the company more than 25 years.

• **Charles J. Dietz,** 71, machine shop foreman of the E. & B. Holmes Machinery Co., Buffalo, died July 7.

• **Thomas C. Delaval-Crow,** 61, for 26 years chief engineer of the New Departure Div. of General Motors Corp., at Bristol, Conn., died June 28 after a prolonged illness.

• **Walter F. Henly,** retired sales manager of the Hendey Machine Co.'s New York office, died July 13.

• **Bernard Field,** 72, engineer and for 25 years operator of the former Plymouth Stove Foundry, Plymouth, Mass., died July 5.

Northern OVERHEAD ELECTRIC CRANES

Handling heavy loads with Northern Overhead Cranes allows the use of your entire floor space for production. No other means of handling allows the use of every square foot of floor space and provides handling facilities over the entire area.

Northern Overhead Cranes are designed to handle heavy loads quickly and carefully. No matter how large or how small the loads to be handled, there is a Northern Crane designed to suit your most exacting requirements. Fifty years of experience as crane builders guarantee the performance of Northern Cranes.

NORTHERN ENGINEERING WORKS

General Offices: 2625 ATWATER ST.
DETROIT 7, MICH.

HEAVY DUTY CRANES • LOW HEADROOM CRANES
BUCKET CRANES • TRANSFER CRANES • ELECTRIC
HOIST CRANES • HAND CRANES • ELECTRIC HOISTS
AIR HOISTS • SPECIAL CRANES AND HOISTS

3137

Dear Editor:

ALUMINUM ENGINES

Sir:

In the May 15 issue there appeared an article entitled "Lightweight Gasoline Engines Made From Diecastings." . . . Considerable emphasis was placed upon the fact that the usual method of producing such engines would have been to use iron castings. However, due to costs, floorspace, shortage of foundry facilities, etc., aluminum was selected to replace cast iron. Naturally this fact disturbed me and in bringing the matter to the attention of Meehanite foundries through our bulletin, several interesting facts were brought to light, one of the most important of which I believe is the statement: "One thing that must be borne in mind is that the engine in question is 2-cycle which lends itself very favorably to the type of production outlined in the article." Thus it would seem that while you had an excellent production story, it would appear that the emphasis upon the foundry angle as being the reason for the elimination of cast iron and the selection of aluminum diecastings was slightly misdirected. There are always right and wrong applications for weldments. Competition is always interesting and in the matter of materials merits more conscientious study by foundries, welders, die casters, plastic molders, etc. It might be of some interest to comment in passing that the motor manufacturer whose technique is so well described in the article specifies Meehanite castings for permanent molds used in their production.

Editorially, I feel that it is well that these things are so adequately and completely described. In my opinion there is today not sufficient constructive thinking in the iron foundry industry with regard to markets and the possibility of sizable replacements of iron castings even in instances where quality castings would be the best engineering material. A lot of the old indifference and smugness inculcated in many minds during the war is still in existence.

C. E. HERINGTON
Manager
Sales Engineering Dept.
Meehanite Metal Corp.
New Rochelle, N. Y.

DISTILLATION OF SCRAP

Sir:

I find in the Mar. 27 issue, in Newsfront, the notice referring to "the use of inert gases such as nitrogen and argon in the distillation and separation of contaminating elements from nonferrous scrap. The technique permits recovery of copper from brass scrap and aluminum from practically worthless aluminum alloy scrap. . . ." I am very much interested in this subject and would be obliged if you could give further details. . . .

ANTON SCHWARZ
Bombay, India

● Considerable information on the distillation of zinc from brass and similar alloys is contained in Bulletin 124 of the Intercontinental Engineers, Inc., 176 West Adams St., Chicago 3, a copy of which has been forwarded to you. The company reports that the same equipment may be used for recovering zinc from dross or diecast metals. In areas where electric energy is very cheap the equipment may be used to produce zinc from rich ores or from concentrates. It is also possible with this equipment to distill such metals as magnesium or aluminum.—Ed.

SOLDERING ALUMINUM

Sir:

Will you please send us a tear sheet of the article "Soldering Aluminum" by G. W. Birdsall, appearing in the June 26 issue.

D. A. COTTON
Process Dept.
Delco-Remy Div.
General Motors Corp.
Anderson, Ind.

TEMPEST IN A SAUCER

IS YOUR EDITORIAL "TEMPEST IN A SAUCER" TO BE TAKEN SERIOUSLY? IF SO REQUEST PERMISSION TO REPRINT IN OUR COMPANY HOUSE ORGAN

FORD WILDERS
GARLOCK PACKING CO.
PALMYRA, N. Y.

● Editorial, "Tempest in a Saucer" is satire. You have our permission to reprint it.—Ed.

PLASTIC PATTERNS

Sir:

Kindly send me a copy of "Precision Casting With Plastic Patterns" that appeared in your issue of Nov. 15, 1945, pp. 54-59.

ARTHUR E. STEVENS
Development Engineer
R. Wallace & Sons Mfg. Co.
Wallingford, Conn.

LATIN AMERICAN INTEREST

Sir:

We believe that the articles, "Flexible Multi-Transformer Welder Boosts Steel Drawer Output" in the June 5 issue, "A New Principle in Induction Heating" in the June 12 issue, and "Small Parts Inspection by Automatic Gaging" in the June 19 issue, will be of interest to our Latin American readers, and we will appreciate if you will give us permission to translate them into Spanish . . . It will be a pleasure to give a credit line to THE IRON AGE.

ERNEST MAASS
Assistant Editor
El Indicador Industrial
New York

● Permission to translate these three articles into Spanish is granted.—Ed.

CORRECTION

Sir:

On April 29 we sent to you for our client, P. R. Mallory & Co., Inc., Indianapolis, Ind., a news release concerning the Mallory 1000 Metal. We find that there is a mistake in the material sent to you. In the second paragraph the modulus of elasticity should read 20 to 40 million psi instead of 20 to 40 thousand. It will be greatly appreciated if you will make this correction.

V. THOMPSON
Aitkin-Kynett Co.
Philadelphia

● Sorry that the correction arrived too late to be made in the item which was published in the New Equipment section of the May 29 issue.—Ed.

POLISHING SAMPLES

Sir:

One of our clients wants to receive tear sheets from the Jan. 16 issue, of the article entitled, "New Method of Electrolytic Polishing of Electron Microscope Samples." Please let us know if it is possible to send a copy. . . .

W. H. BETZ
Trading & Import Co., Ltd.
Zurich, Switzerland

● Tear sheets have been mailed.—Ed.

JUST A BLOCK AWAY!

Sir:

We are interested in an item printed in the Newsfront section of your Apr. 3 issue, concerning a high temperature resistant paint. Any information regarding this material, or from whom we can secure data—and a possible sample—will be appreciated.

R. C. MILLER
Chemist
Stewart-Warner Corp.
Chicago

● The coating has been developed by Mr. Harry Sweeney of the National Copper Paint Corp. at 1760 W. Diversey Parkway, Chicago 14, which seems but a stone's throw from your own front door at 1826 Diversey Parkway.—Ed.

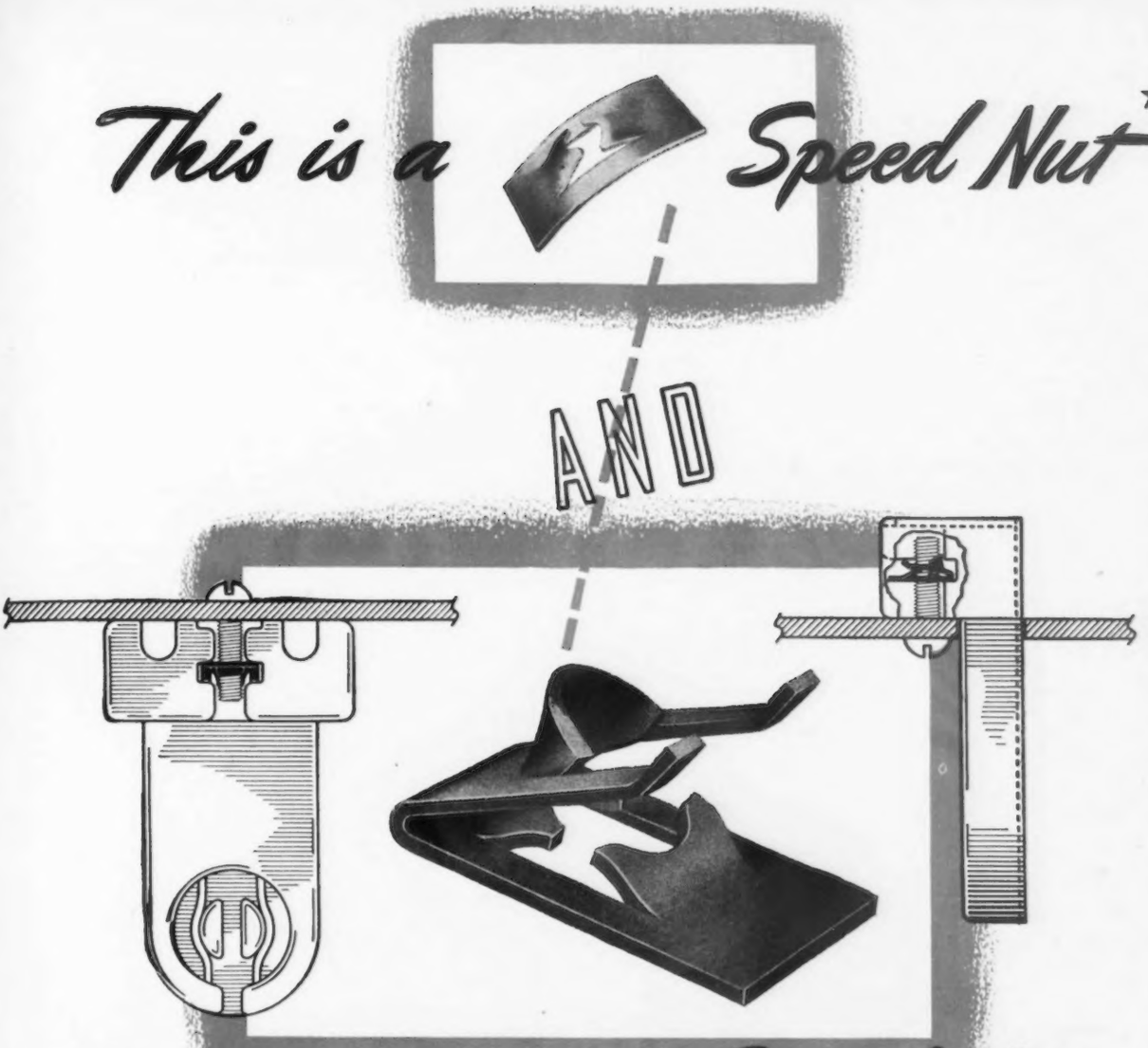
ZINC ALLOY CASTINGS

Sir:

We would appreciate receiving reprints of the article by Herbert Chase on "Zinc Alloy Permanent Mold Castings" appearing in the May 29 issue.

C. W. SMITH
Alkali Laboratory
Detrex Corp.
Detroit

This is a Speed Nut*



AND

THIS is also a *Speed Nut*

● Here is a self-retaining, self-locating and self-locking SPEED NUT designed for fluorescent tube lamp sockets. But it's merely one of hundreds of special shapes that do more than merely hold the screw.

This SPEED NUT C6800 is zipped into the recess in the lamp socket to stay. The turned up ends of the spring arms "bite" into the plastic to lock the SPEED NUT firmly in place. It is self-locating because the extruded collar butts up against the back of the vertical slot to line up the SPEED NUT impression with the screw hole. It's self-retaining and self-locking because of the exclusive spring tension lock of the SPEED NUT Brand of fasteners. Fits any socket of this type using standard 6-32 machine screws.

Why not let us design a fastener for you that can be applied **twice as fast** and do a lot of other things besides holding the screw. Write for samples or send your engineering details for a no-charge analysis.

TINNERMAN PRODUCTS, INC.
2040 FULTON ROAD, CLEVELAND 13, OHIO

In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario
In England: Simmonds Aerocessories, Ltd., London
In France: Aerocessoires Simmonds, S. A. Paris
In Australia: Simmonds Aerocessories, Pty. Ltd., Melbourne

Speed MORE THAN 4000 *Nuts** SHAPES AND SIZES

PATENTED

* Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS

Industrial News Summary...

- **Scrap Prices Again on Rampage**
- **Steel Price Increase Seen Sure**
- **Pig Iron Quotations Boosted $3**

THE fever chart—scrap prices—this week reached an all-time high in steel industry history. Following last week's inflationary binge the average price of heavy melting steel at Pittsburgh, Chicago and Philadelphia moved up $2.25 a gross ton this week. THE IRON AGE steel scrap composite this week stands at $40 a gross ton, 33¢ a ton above the previous peak reached on Mar. 18 this year when the index was $39.67 a ton. The index last week was $37.75 a gross ton.

At mid-week there was no indication that the upward splurge in scrap prices which has made a terrific impact on steelmaking costs would show a reversal in trend. In the past 2 months the steel industry has seen the average price of scrap advanced $10.50 a ton. Following last week's sharp uptrend, heavy melting steel this week is up $1.50 a ton at Pittsburgh, $1.75 at Philadelphia and $3.50 at Chicago. Advances have also occurred at other consuming centers.

Almost all producers late last week and early this week advanced the price of all pig iron grades $3 a ton. Thus, nonintegrated steel mills—those which must buy scrap and pig iron—are up against the biggest squeeze play in their history. In some cases these smaller mills have been able to offset rising costs by charging higher prices than those billed by major steel producers. This condition, however, is not universal and sporadic price increases may be expected soon from nonintegrated steel firms.

The gee-haw-whoa steel price attitude current this week is only a symptom of the major dilemma in which the steel industry finds itself. There is no longer any doubt that the Truman price plea has caused the U. S. Steel Corp. and other companies to make a completely new study of their steelmaking costs. These were still going on this week.

IN view of higher scrap costs, a recheck on higher steel labor costs and a double check on what the coal increases will mean to the industry will without doubt result in a definite price increase for major steel products. Emphasis will be on those products which are showing a loss or a low return. While some sources claim that the average price increase will not be $5 there has been no new information on the probable increase during the past few weeks. Many producers insist that their average cost is up more than $4 a ton. It seems definite that the price increase when it comes will be highly selective but will include many products.

In the turmoil of the steel price discussions some sources may have lost sight of the fact that second quarter steel earnings reflect the all-time high in steel labor rates as a result of wage increases which became effective Apr. 1. These were not reflected in first quarter earnings.

FOR each day that steel prices are not advanced, the loss in revenue to the industry on the basis of an average $3 a ton advance is about $5,430,000; on the basis of an average $4 a ton advance $7,200,000 and on an average basis of $5 a ton the daily loss of revenue is approximately $9 million. More serious to the steel industry is the fact that much of the profitable operation today is due entirely to a demand for steel which far exceeds the current supply. When this situation changes steel firms will be forced to give up "backyard selling" and reenter areas where they must absorb substantial freight in a competitive market. The biggest headache that the industry faces is a rigid wage rate which is the highest in steel industry history and the knowledge that by 1948 the steel operating rate will be lower than it is at present and thus closer to the high break-even point.

The steel industry this week advanced its operating rate two points to 94 pct of rated capacity. Indications are that the rate next week will be more than 95 pct. Despite high scrap prices major consumers are apparently obtaining necessary supplies.

The steel industry during the past month has flooded the freight car builders with material for new cars. During June and in many cases into July steel producers have overshipped the promised tonnages on all products to the railroad car builders. In some instances certain mills have been shipping between 25 and 50 pct more, depending on the particular item that had been promised. Apparently the industry wants to make doubly sure that the government will stay out of the steel distribution picture.

According to scrap sources tie-in sales involving scrap, ingots and finished steel are on the increase. Outside sources such as automobile makers claim that such deals are part of the spark which set off higher scrap prices. Until such time as steel demand declines or steel production more nearly satisfies demand, conversion deals and gray markets are expected to flourish. One large automobile company has its men scouring the entire country in an effort to obtain scrap. Vendors in every state are being asked to direct scrap through their local dealer to this automobile company. An elaborate followup in procedure has been set up to see that the scrap reached this automobile maker.

• **FIFTY-FIFTY**—For the first 6 months freight car production for domestic and foreign railroads was about even. There were 21,737 freight cars built for domestic roads, 4399 of which were built in railroad shops. For the same period this year, 26,569 freight cars were built for export. As of July 1, 109,566 domestic freight cars were on order compared to but 6798 export cars.

• **ORE CONSUMPTION**—Consumption of Lake Superior iron ore in June by U. S. and Canadian blast furnaces dropped to 6,499,882 gross tons, compared with 6,884,803 gross tons in May, according to the monthly report of the Lake Superior Iron Ore Assn. June consumption of iron ore reflected curtailed steelmaking operations which were the result of the coal crisis, but raised 1947 cumulative consumption to 40,230,652 gross tons. Gross tons of iron ore on hand at furnaces and Lake Erie docks totaled 21,745,798 tons July 1, as compared to 17,618,341 tons June 1 and 26,264,914 on July 1, 1946. Active blast furnaces depending principally on Lake Superior iron ore numbered 142 in the U. S. and eight in Canada. Idle blast furnaces numbered 41 in the U. S. and two in Canada, according to the association's report.

• **GRAY MARKET DOPE** — Additional evidence that gray market operations will be with us for some time yet came to light in Chicago. A certain operator with about $500,000 in ready cash and liquid assets was attempting to borrow from a bank another $500,000, making a million in all, for a tonnage of sheets and structurals. Apparently tonnage was to be supplied on a quarterly basis. Because of the gray market hullabaloo, the bank turned him down.

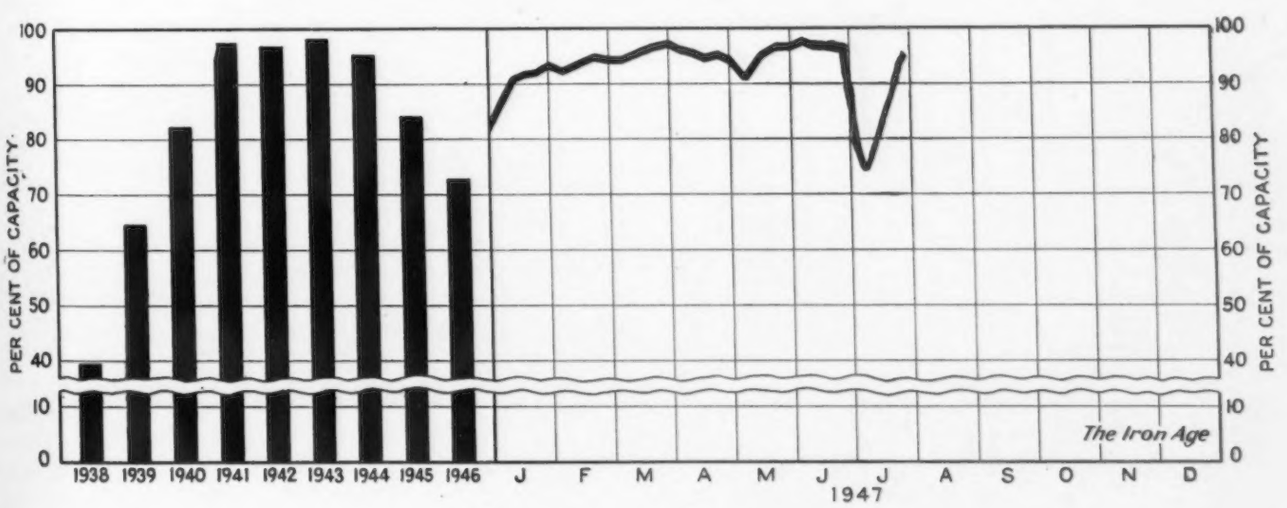
• **EXPORT LICENSES**—Regulations governing issuance of export licenses are due for further tightening by the Commerce Dept.'s Office of International Trade. OIT is now in process of drafting a new regulation which will prohibit the use of an export license covering orders cancelled prior to the effective date of the license. OIT's new regulation is being designed to halt the current practice of obtaining an export license for a specified order and subsequent replacement by the applicant of the original order with a substitute, according to Francis E. McIntyre, director of OIT's Export Control Branch. OIT, in such cases, cannot control the substitute order, Mr. McIntyre points out.

• **STEEL WAGES**—As a result of wage increases granted to employees effective in April 1947, the steel industry's total wage and salary bill was increased $18 million in that month and $25 million in May, over the March wage bill of $150,560,000, according to the American Iron & Steel Institute. The April wage and salary total for the industry is estimated at $168,266,000, based upon actual returns from 120 companies, and the May total is estimated at $175,793,000. The average hourly rate of pay for hourly, piecework and tonnage employees in May amounted to $1.556, almost 18¢ an hr above the March hourly rate of $1.379, and slightly higher than the April average of $1.533. The May 1947 rate is almost 20¢ an hr higher than the average rate of pay during the corresponding month of 1946, which came to $1.358. Average hours worked by the industry's wage earners during May totaled 39.1, down from April average of 40.0 hr per week. In May, the industry's employees numbered 614,800, the highest total for the industry since 1943. Of that number, 524,600 represented wage earners, with the balance comprising salaried employees. The corresponding figures for April were 610,700 and 520,700 respectively.

• **BUSINESS BAROMETER**—A birdseye view of the machine tool industry's operations in June indicates shipments of about $22 million, new firm orders totaling about $22 million, and cancellations around $2,500,000. Unfilled orders stand at about $120 million. The apparent balance between shipments and new firm orders may be due in part to the price increases in machine tools, announced by several segments of the industry, which may have "driven in" some of the new business. At the same time, the industry's June performance again reflects the strong underlying trend in capital goods.

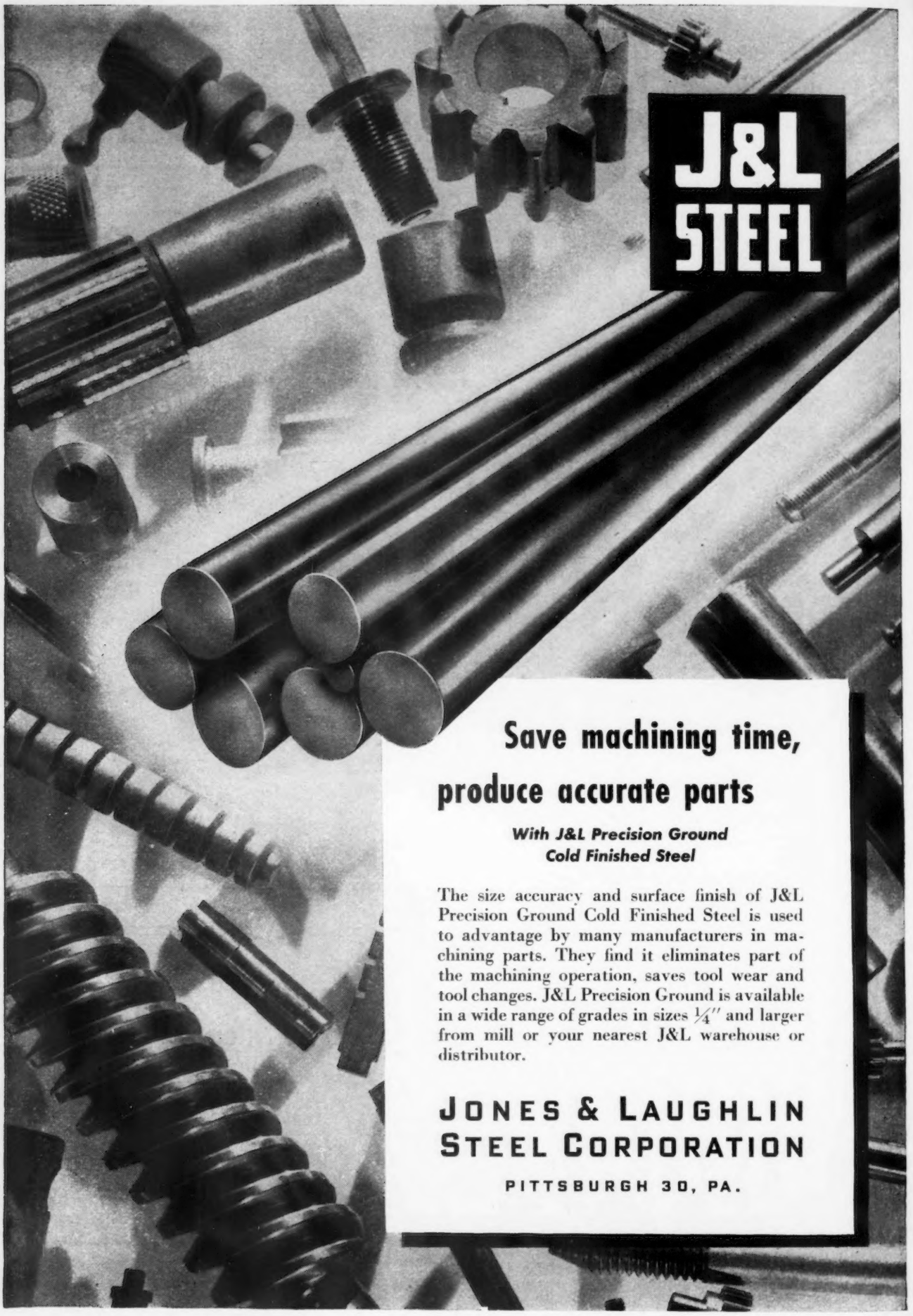
• **AUTO WAGES**—Upward wage adjustments of wages of automobile workers have added about $150 million to the industry's payroll since January 1947. The majority of auto workers have received increases equivalent to 15¢ per hr. Estimated cost of pension plans, increased vacation and call-in pay or other benefits are not included in the estimate. Employment in the industry has reached an all-time high of approximately 1 million workers, including salaried employees.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
July 15	100.5	90.0	81.5*	95.0	90.0*	104.0	80.0	99.0	101.0	94.0	98.0	82.0	93.0	92.0
July 22	101.5	95.0	89.0	95.0	96.0	102.0	85.0	99.0	101.0	99.0	98.5	84.5	94.0	94.0

* Revised.



Save machining time, produce accurate parts

With J&L Precision Ground Cold Finished Steel

The size accuracy and surface finish of J&L Precision Ground Cold Finished Steel is used to advantage by many manufacturers in machining parts. They find it eliminates part of the machining operation, saves tool wear and tool changes. J&L Precision Ground is available in a wide range of grades in sizes ¼" and larger from mill or your nearest J&L warehouse or distributor.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PA.

Substantial Increase in German Steel Output Seen Far Away

Coal Shortage Seen as Big Hurdle in Keeping Steel Below Agreed Limit

o o o

By JACK R. HIGHT
Associate Editor

o o o

New York

• • • **Demands for increased** steel output from the Ruhr as an integral part of a Marshall plan are not expected to bear fruit in the near future. Since the end of the war there has been much talk concerning the existence of a 12,000,000 tons steel industry in Germany, despite war damage, but there will be many problems connected with getting production back on that level.

There was a great anxiety among the four occupying powers to get a limit set on German steel output under the Potsdam agreement, but this anxiety had nothing to do with physically limiting the German steel industry operating rate. There has not been enough steel produced since the end of the war in Germany to worry anybody.

The anxiety which prompted the establishment of a level for the future of the steel industry was motivated primarily by a desire to settle the agonizing issue of reparations. On this basis, the four powers never did work out an operable plan that would solve the reparations issue. Two years after, there has been an insignificant amount of steel mill equipment removed for reparations.

At the same time, the shortage of coal has effectively prevented those German steel mills which are in operation from reaching the 5.8 million metric ton limit which has existed by agreement since February, 1946. There are several opinions on the causes for the shortage of coal in Germany.

British officials have done a careful job of keeping control of both the Ruhr coal mines and steel industry. This has looked inviting to many outsiders, and most of the other countries have graciously offered to run the coal mines, and all have promised to get more coal than British administration has. There are hundreds of ambitious British military government officials who are working hard to get socialized German coal mines and steel mills into operation.

This determination to nationalize the steel mills has served to alienate those remnants of the steel mill management that have survived the decimation wrought by the de-nazification boards. The hazards of a maniacal occupation financial policy have also served to delay any kind of industrial production.

If general agreement on a program for European self-help and American aid is drawn up this year, and the French people overcome their fear of rebuilt Germany, coal will be the first problem for increased steel output. This year's German steel production in the Ruhr was based on a 4.3 million metric tons. The figure was chosen because that was the top limit of available labor. Actual production this year has been at a far lower rate, because of the inadequacy of coal supplies. When sufficient coal is available, the manpower problem will become paramount.

There has been no need to date to increase steelmaking manpower, but steel mill operators in the Ruhr expect this to be a serious problem. In certain areas where several mills were in operation last summer, the manpower situation became a local problem. At that time, short of wholesale transfers of manpower, there was no solution in sight. The already chaotic housing situation in the Ruhr makes such transfer very

The International Handicap

difficult. It the food situation can be improved, output per man will doubtless go up, as the experience with special food incentive programs for the coal miners has demonstrated.

When satisfactory labor supplies are available, with the required raw materials, steel mills will be able to expand output rapidly within the limitations of existing facilities. There is general agreement that for up to about 10 million metric tons there are plenty of undamaged mills available. After that point, there will be a certain amount of repair work to be done before units can be put back in full production.

In this case the result will be that the German steel industry itself will tend to consume an abnormally large tonnage of steel. Just how the last 3 years of disuse, rust, and cannibalizing will affect the reconditioning remains to be seen.

Commerce Department Asked for Most Stringent Export Controls

Washington

• • • **Tightening up of** export controls on steel calls for an active seven-point program, the Steel Subcommittee of the Senate Small Business Committee was told last week.

Committee consultant Homer Zopf told the Senate group that the Commerce Dept's Office of International Trade must act promptly to correct maldistribution problems arising out of the estimated 15 million ingot ton imbalance between supply and demand.

Investigations undertaken for the subcommittee, according to Mr. Zopf, require the following prompt action on the part of OIT:

(1) Set realistic export quotas that take into consideration unfilled needs for steel as indicated by inability of consumers to obtain supplies, and that are based on proven needs of foreign countries.

(2) Limit exports by a rigid control of licenses issued against export quotas.

(3) Grant licenses on the basis of country destination and only according to demonstrated needs.

(4) Either install export control documents covering shipments to Canada, or ask Canada to limit issuance of import permits.

(5) Stop issuing export licenses ex-quota.

(6) Limit procurement for export to recognized producers and distributors.

(7) Recall outstanding export licenses issued prior to April 1 and reissue licenses only for a single country destination after thorough investigation of needs.

Iron and steel exports totaled 5 million tons in 1946, Mr. Zopf pointed out, despite tremendous domestic needs. This year's exports, he estimates, are running about 6.5 million tons, based on shipments during the first four months of 1947. "The increase in exports and the corresponding scarcity in domestic supplies of iron and steel seems to put the problem squarely up to the Dept. of Commerce," Mr. Zopf declared.

Senate Subcommittee Demands Cut on Quotas For Steel Items Now Scarce

o o o

Present administration of export controls is ineffective in three respects, Mr. Zopf believes: (1) export quotas are unrealistic, (2) exports are not distributed among foreign countries according to needs, (3) participation in export trade in the gray market is not discouraged.

First quarter shipments, according to Commerce Dept. statistics, totaled 1,626,000 tons in the face of a 300,000 ton quota set by the Export Policy Committee. The quota established for the second quarter is reported at 400,000 tons, but Mr. Zopf says some 623,000 tons were shipped in April alone. "The explanation will probably be that at some time since export quotas were re-established in September, 1946, excessive quantities of steel have been licensed for export," Mr. Zopf states.

Maldistribution of steel available for export "is due entirely to the use of the consolidated export license," Mr. Zopf stated for the benefit of the Commerce Dept. He cites the following export statistics for the first three months of 1947: Three countries, Canada, Brazil and Argentina, received more than half of exports of black steel sheets. Five countries, France, Argentina, Canada, Sweden, and Brazil, received more than half of the steel bars, nonalloy, exported. Five countries, Venezuela, Mexico, Cuba, Netherlands and France, received more than half of the concrete reinforcing bars exported.

Four countries, Canada, France, Sweden and Argentina, received more than half of the structural sheets exported. Three countries, Mexico, Brazil and Argentina, received more than half of the barbed wire exported. Three countries, Venezuela, Saudi Arabia and Colombia, received more than half of the seamless pipe casing and oil line exported. Only one European war-devastated country — France —has been a major participant, Mr. Zopf points out.

Consideration is now being given by OIT to individual licensing for export of some steel commodities, according to Francis E. McIntyre, director of OIT's Export Control Branch. Asked by Ray Dickey, committee counsel, if OIT does not feel that items in extremely short supply, such as sheet steel should be placed on an individual license basis, Mr. McIntyre admitted, "we're considering it." Almost all items are under general license at present.

OIT, according to Mr. McIntyre, is now reviewing "a number of steel products" with a view to transferring them from the general license category to individual license. Assuming that OIT makes such a change, no noticeable effect would be apparent until the fourth quarter, since quotas for the current quarter already are in effect.

"We cannot hope to spare enough steel to meet all urgent foreign needs," Undersecretary of Commerce William C. Foster told the subcommittee. "There will be severe shortages of steel throughout the world for many months to come and we seek to approve only such exports as will alleviate the severest hardship abroad."

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1946

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		*Calculated weekly production, all companies (Net tons)	Number of weeks in month
	*Net tons	Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	Percent of capacity		
January	3,530,192	51.1	207,512	47.4	135,183	28.9	3,872,887	49.6	874,241	4.43
February	1,301,719	20.9	25,905	6.6	65,058	15.4	1,392,682	19.8	348,171	4.00
March	5,950,241	86.2	363,949	83.1	194,574	41.6	6,508,764	83.3	1,469,247	4.43
1st Quarter	*10,782,152*	*53.8*	*597,366*	*47.0*	*394,815*	*29.1*	*11,774,333*	*51.9*	*915.578*	*12.86*
April	5,336,317	79.8	286,088	67.5	238,790	52.8	5,861,195	77.5	1,366,246	4.29
May	3,702,184	53.6	153,409	35.0	217,027	46.4	4,072,620	52.2	919,327	4.43
June	5,148,660	77.0	251,253	59.2	225,860	49.9	5,625,773	74.4	1,311,369	4.29
2nd Quarter	*14,187,161*	*69.9*	*690,750*	*53.7*	*681,677*	*49.7*	*15,559,588*	*67.9*	*1,195,971*	*13.01*
1st 6 months	*24,969,313*	*61.9*	*1,288,116*	*50.4*	*1,076,492*	*39.4*	*27,333,921*	*59.9*	*1.056,588*	*25.87*
July	6,027,388	87.5	365,332	83.6	225,963	48.5	6,618,683	84.9	1,497,440	4.42
August	6,291,363	91.1	373,837	85.4	259,322	55.5	6,924,522	88.7	1,563,098	4.43
September	5,951,232	89.2	371,465	87.8	232,869	51.6	6,555,566	86.9	1,531,674	4.28
3rd Quarter	*18,269,983*	*89.3*	*1,110,634*	*85.6*	*718,154*	*51.8*	*20,098,771*	*86.8*	*1.530,752*	*13.13*
9 months	*43,239,296*	*71.1*	*2,398,750*	*62.2*	*1,794,646*	*43.6*	*47,432,692*	*69.0*	*1.216,223*	*39.00*
October	6,312,604	91.4	387,933	88.6	251,205	53.8	6,951,742	89.0	1,569,242	4.43
November	5,873,264	87.8	318,350	75.1	266,157	58.8	6,457,771	85.4	1,505,308	4.29
December	5,286,799	76.7	222,704	51.0	250,998	53.8	5,760,501	73.9	1,303,281	4.42
4th Quarter	*17,472,667*	*85.3*	*928,987*	*71.5*	*768,360*	*55.4*	*19,170,014*	*82.8*	*1.458,905*	*13.14*
2nd 6 months	*35,742,650*	*87.3*	*2,039,621*	*78.5*	*1,486,514*	*53.6*	*39,268,785*	*84.8*	*1.494.815*	*26.27*
Total	60,711,963	74.7	3,327,737	64.6	2,563,006	46.6	66,602,706	72.5	1,277.382	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

* Revised January through December, 1946.

YEAR 1947

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter	*18,989,581*	*95.0*	*1,077,901*	*84.8*	*875,312*	*69.9*	*20,942,794*	*93.1*	*1,628,522*	*12.86*
April	6,360,294	95.4	375,675	88.6	306,844	73.5	7,042,813	93.8	1,641,681	4.29
* May	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
† June	6,295,137	94.4	351,353	82.9	305,726	73.2	6,952,216	92.6	1,620,563	4.29
† *2nd Quarter*	*19,290,147*	*95.4*	*1,099,906*	*85.5*	*934,473*	*73.8*	*21,324,526*	*93.7*	*1,639,087*	*13.01*
† *1st 6 Months*	*38,279,728*	*95.2*	*2,177,807*	*85.2*	*1,809,785*	*71.9*	*42,267,320*	*93.4*	*1,633,835*	*25.87*
July										4.42
August										4.43
September										4.28
3rd Quarter										*13.13*
9 months										*39.00*
October										4.43
November										4.29
December										4.42
4th Quarter										*13.14*
2nd 6 months										*26.27*
Total										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

* Revised
† Preliminary figures, subject to revision.

Official Charges Steel Distribution Promise Broken by Industry

Washington

• • • **In addition to** reiterating the allegation that "economic concentration" continues to expand to the increasing detriment and probable squeezing out of many smaller competitors, an indirect charge has been made by a Federal Trade Commission official that the steel industry has broken its word to the government concerning equitable distribution of steel after distribution controls were dropped.

In a statement, based on a study of the evidence presented before the Senate Small Business steel subcommittee, Earl A. Graham, economist in charge of the current FTC steel study, (THE IRON AGE, Apr. 10, p. 101, June 26, p. 74), told the Martin subcommittee that the evidence presented so far supported the conclusion that "some, if not all, of the large steel companies are not distributing scarce steel products in either the pattern of product mix which prevailed before the war or in their sales to their prewar customers on a basis of prewar history of purchases."

This, he added, is "contrary to the informal engagements which it is understood that the steel producers entered into with government authorities as a condition for removal of government control of steel distribution."

Moreover, Mr. Graham declared, the problems now faced by the semiintegrated and nonintegrated companies in obtaining raw materials will grow, rather than decrease, over the next few years if the large producers continue expansion in the fields of fabrication and manufacture of consumer goods. This will be particularly true, he said, if the United States must supply large quantities of steel to Europe.

Decrying the entry of the basic steel companies into the fabricating field in which they "compete directly, both for the supply of steel and for sales, with their long-time customers," Mr. Graham saw a dim future for nonintegrated fabricators.

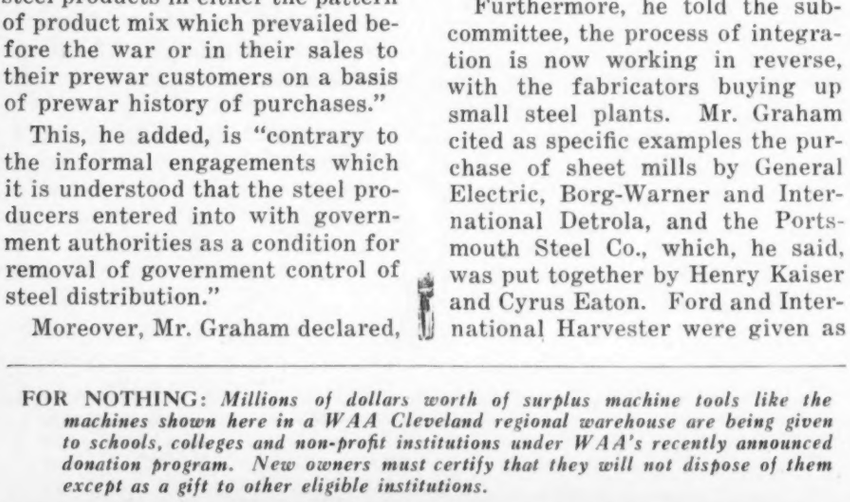
"We may be witnessing the beginning of the last steps in the process of vertical integration of the steel industry from ownership and control of raw materials, iron ore, and coal, to broad control over the final elaboration of steel into goods for industry and the home," he said, basing the opinion on surveys of steel activity since 1930.

Furthermore, he told the subcommittee, the process of integration is now working in reverse, with the fabricators buying up small steel plants. Mr. Graham cited as specific examples the purchase of sheet mills by General Electric, Borg-Warner and International Detrola, and the Portsmouth Steel Co., which, he said, was put together by Henry Kaiser and Cyrus Eaton. Ford and International Harvester were given as earlier purchasers of production facilities.

U. S. Steel, he declared, had set the pattern in vertical integration and now 18 leading companies control 88 pct of cokemaking capacity, 92 pct of the blast furnace capacity, and 89 pct of the steel ingot capacity. Again citing U. S. Steel as an example, he said that although its output has dropped to about 35 pct of total industry capacity, it still produced three times as much ingot as in 1901.

Questioned by the committee as to the increase in total industry ingot capacity for the same period, Mr. Graham said it was 3.8 times as great as in 1901, a greater proportionate increase than for U. S. Steel.

FOR NOTHING: *Millions of dollars worth of surplus machine tools like the machines shown here in a WAA Cleveland regional warehouse are being given to schools, colleges and non-profit institutions under WAA's recently announced donation program. New owners must certify that they will not dispose of them except as a gift to other eligible institutions.*



Walter Reuther Asks Layoff Investigation

Detroit

• • • **Walter P. Reuther,** UAW-CIO president, is asking for an investigation of layoffs in the automobile industry attributable to steel shortages. In a recent letter to Sen. Robert A. Taft, chairman of the Joint Congressional Committee on the Economic Report, Reuther asked that the committee direct its investigation "immediately toward heavy layoffs in the automobile industry."

Reuther charged that 32,000 automobile workers were laid off recently for periods as long as 2 weeks. Managements of Chrysler, Briggs and Nash-Kelvinator companies, where the bulk of the layoffs occurred, attributed them to a shortage of steel.

"I would like to make the concrete suggestion that your committee call before it as witnesses representatives of the management of both the steel and the automobile industries to explain the inability of the automobile industry to achieve full production and maintain continuous employment at a time when the demand for automobiles far exceeds the supply."

Reuther said it is difficult for the UAW-CIO to understand why, with steel production in the first quarter of 1947, 35 pct above the quarterly average for 1940, automobile production in the first quarter of 1947 was only 4 pct above the quarterly average for 1940.

Navy Admits 165,500 Tons Pacific Scrap Could Be Shipped

Guam and Luzon Are Principal Accumulation Centers Of Existing Supplies

Washington

• • • **Industry efforts** to pry steel scrap loose from Navy overseas bases brings the Navy Dept.'s official admission that some 165,500 tons in the Pacific area are available on an "as is, where is" basis and with proper preparation can be shipped back to the United States.

Navy Dept. and industry representatives agree, after surveying five principal Pacific scrap piles, that this amount of combat machinery can, with assistance from Navy contractors, be removed from accumulation points on Guam and Luzon. The Navy said it would supply handling equipment "to the maximum extent feasible" to the successful bidder on Guam scrap.

Of the five bases inspected by the special committee appointed by Navy Secretary James Forrestal, only those stocks at Guam, Subic Bay and Manila are worth economic consideration, the committee believes. Some 115,000 tons on Manus, Samar and in the Manila Bay area are written off by the committee as not worth the expense of gathering, loading and shipping.

Members of Secretary Forrestal's special committee—Lt. Com. Robert L. Ellis, of the Navy's Supply Corps; Leslie G. Knight, of Bethlehem Pacific Coast Steel Corp., and Leonard I. Abrams, of Atlas Steel & Supply Co.—learned that any disposals will be on "as is, where is" basis. The Navy points out that it lacks funds, personnel and ships to handle scrap shipments.

Following is the committee breakdown of available scrap by location:

Location	Physically Feasible to Return	Not Physically Feasible to Return
Guam	15,000	.....
Manus	.....	5,000 plus
Samar	.....	10,000
Subic Bay	101,500	.....
Manila	50,000 shore scrap	100,000 sunken ships
Total	165,500	115,000

NOTE: Estimates are based on tons of 2000 lb covering scrap of No. 2 or better quality only.

Guam scrap piles represent the supply which may be most feasibly removed, the committee points out. "It is physically and economically feasible to return Guam scrap to the United States, particularly so should the Navy provide necessary trucks and handling equipment," the report states. The Guam project would be further expedited by Navy Dept. approval of participation in such projects by its Pacific contractors. J. H. Pomeroy Co., Inc., and Pacific Bridge Co., two such contractors, are presently engaged in large scale construction projects for the Navy.

° ° °

Because of the abandonment by the Navy Dept. this month of bases on Manus and Samar Islands, the committee concludes that it is inadvisable to give further consideration to removal of scrap in those locations. Scattered and inaccessible locations, corrosion and jungle growth brought the committee to this conclusion.

Subic Bay scrap piles, located some 50 miles north of Manila, consist largely of LSTs and other combat craft, and are easily accessible by good roads. An ample labor supply and a prevailing wage rate of $1.75 per 8-hr day, contribute to the desirability of scrap operations in this area.

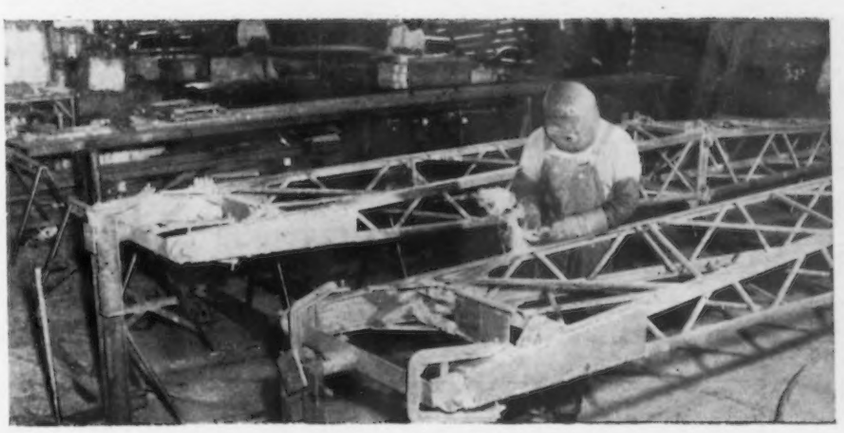
Most readily accessible and economically attractive scrap in the Manila Bay area is in land scrap scattered about the city of Manila. Since virtually the entire south side of Manila was razed by the retreating Japanese in 1945, the volume of available scrap is enormous. Although there are 84 sunken ships in Manila Bay, the committee questions the feasibility, "physically and most certainly economically," of salvaging any water-bound scrap.

Shore scrap, however, is easily accessible, an ample labor supply (prevailing rate: $3.50 per 8-hr day) is available, and several large contracting firms are qualified to undertake the gathering, preparation and outloading of all available scrap. The Philippine government, owner of the scrap, has imposed a $5 per ton export duty on all scrap shipped from the islands.

Shipping rates, as quoted unofficially by representatives of American President Line and American Mail Line, will run between $10 and $12 to the West Coast, according to the committee members. A $2 to $3 differential to Atlantic Coast ports is "possible of attainment." Lighterage and stevedoring charges at Manila probably will average $2.50 to $3 per ton.

Costs of oxygen and acetylene in the Pacific operations probably will be "excessively high," the committee finds. Hawaiian Gas Products Co., of Honolulu, quoted the committee rates of 65¢ and $1.75 per 100 cu ft of oxygen and acetylene, respectively, conditioned upon cylinders being furnished by the buyer. Navy supply of the necessary cylinders, which is reported to be ample, would practically be a prerequisite to the economic feasibility of an effective scrap removal program, the committee feels.

ARC BOOMS BOOM: *Said to be among the first all welded crane booms of its kind, this folding crane boom is being arc welded by Gledhill Road Machinery Co., Galion, Ohio. The company reports that electric arc welding has increased production of its road-building machinery. For this operation 32 lb of electrodes were used.*



Army Sees 300,000 Tons of Scrap for Return in Coming Year

Washington

• • • **Approximately 300,000** tons of Army-generated ferrous scrap is scheduled to be made available at overseas bases for import into the United States within the next year, according to official War Dept. estimates.

The War Dept. figures, presented to the steel subcommittee of the Senate Small Business Committee by Brig. Gen. T. M. Osborne, chief of Supply Group Service, Supply and Procurement Division, are taken from estimates submitted in May by theater commanders in Europe, Japan and the Carribbean and Mediterranean areas.

The department's figures, showing amounts estimated to be available in November 1947 and amounts estimated to be available in May 1948 are shown in the accompanying table.

General Osborne points out that since Aug. 16, 1946, the War Dept. has not returned any scrap to the U. S. as ballast. Shipping and stevedoring costs and delays in loading ships forced the department to cease returning scrap as ballast and to institute a system of returning scrap as paid cargo only. The department's present policy of disposing of ferrous scrap solely to purchasers who agree to return it to the U. S. dates from a directive of the Office of War Mobilization and Reconversion, dated Dec. 3, 1946.

Total ferrous scrap returned from overseas by the Army through April 1947 is 823,762 gross tons, according to General Osborne while the total quantity of scrap sold by the Army in the U. S. from Jan. 1, 1944, to May 31, 1947, is 2,850,867 gross tons. These totals do not include approximately 165,000 gross tons of ferrous scrap located in Austria and Germany which was sold under the policy that it must be returned to the U. S., General Osborne points out. These sales were made on an "as is, where is" basis, and to date none of this 165,000 tons has been returned.

War Department to Keep Close Check on Activities Of The Canterbury Corp.

o o o

Sales of scrap solely to persons who will return it to the U. S. have resulted in a loss of revenue to the U. S. Government, according to General Osborne. He cites one sale comprising the 165,000 gross tons which carried a sale price of $7.50 per ton for return to the U. S. Offers of $20 per ton were received for the material if it could have been used on the European continent, he states.

Subcommittee doubt that at least some of the scrap now being sold to buyers may not be finding its way to the U. S. is expressed by Raymond Dickey, subcommittee counsel. (THE IRON AGE, July 17, p. 98.) Mr. Dickey last week declared in a subcommittee hearing that the Canterbury Corp has signed a contract to move some 150,000 tons of scrap to the U. S., but evidence gathered by the subcommittee discloses that part of this scrap has been moved through Brenner Pass to Turin, Italy, for "processing." Mr. Dickey warned the War Dept., through General Osborne, to keep a close check on Canterbury to make sure that the scrap purchased under Army contract finds its way to the U. S.

An informal subcommittee investigation of Canterbury has disclosed that although Canterbury claims to be registered as a Delaware corporation, state records do not disclose any of the officers of the corporation, according to Mr. Dickey. The subcommittee is very much interested in finding out who the Canterbury Corp. is, Mr. Dickey declared.

Reiterating an earlier position, Robert W. Wolcott, chairman of the steel, foundry and scrap industries committee for expediting iron and steel scrap, appealed to the committee last week to "see to it that every possible source of scrap be explored and action taken to see that it flows back into American commercial channels."

Mr. Wolcott also recommends that all Army-generated scrap in Britain be sold and left where it is, because of Britain's peacetime dependency upon scrap imports from the U. S. scrap supplies in Italy also should be made available to Italian industry, except for certain quantities required as ballast for ships returning to the U. S., according to Mr. Wolcott.

More than 1 million tons were made available to U. S. scrap consumers in the 12-month period ended June 30, 1947, according to Robert C. Turner, economic adviser to presidential assistant John R. Steelman. Of this amount War Assets Administration contributed 300,000 tons, Maritime Commission 450,000 tons, War Dept. 200,000 tons, and Navy Dept. 300,000 tons.

"As far as scrap from government sources is concerned, we'll probably reach the bottom of the barrel before the end of 1947," Mr. Turner predicted. "After that time the only scrap will be in dribs and drabs not worth bothering about."

Army Scrap Availability in Next 12 Months

Headquarters	Available Now	Available November 1947	Available May 1948
European Command	None	50,000	200,000
Japan	865	3,865	4,165
Caribbean	1,584	5,435	5,973
Mediterranean	5,400	20,000	None. Expected to be closed out in less than 1 year.
Other	None	None	None

Total expected to be available within next year: 297,285 gross tons.

Hold Symposium

Cambridge, Mass.

• • • **National Research Corp.** in cooperation with the Div. of Industrial & Engineering Chemistry, American Chemical Society, has announced plans for a high vacuum symposium to be held this fall in Cambridge, Mass., Oct. 30-31. Attendance will be restricted to technical and scientific personnel concerned with industrial applications of high vacuum. Invitations will be issued on recommendations of the various symposium division heads, with particular effort being made to promote discussion of low pressure applications in the process industries.

McCoy Stands Behind Steel Industry; Says Capacity Will Be OK

Washington

• • • **Confirming generally** the belief of the steel industry that supply and demand should come more nearly into a proper balance within the next 12 months, H. B. McCoy, director of the Office of Domestic Commerce, has predicted that the steel industry will be able to meet all demands by 1950 without additional capacity beyond that now scheduled for completion.

While the accuracy of long range forecasts is debatable, McCoy told the Senate Small Business steel subcommittee, the projection of past steel production and demand and employment records into the future indicates a possible demand of 80 millions tons of finished steel by 1970.

Short-range potential consumption, that is, up to 1950, is estimated at 70 million tons of finished steel, he told the subcommittee. Industry's current plans include expansion of rolling capacity by 2.5 million tons of which perhaps 1 million may become available by the end of 1947.

Both the short and long range projections are based on the current "general" Commerce study of the iron and steel industry which does not deal specifically with the current demand-supply situation. McCoy said, however, that the Department soon "may undertake a detailed study of future needs for steel products," thus confirming an earlier forecast by THE IRON AGE (June 26, 1947, p. 74).

These projections by the Department are based on assumption of no serious work stoppages, continued full employment (less than 5 pct unemployed) and a gross national business of $200 billion or more. Fifteen pct unemployment, however, would cut steel demand to an estimated 64,000,000 tons by 1950, and 70,000,000 tons by 1970, according to the Commerce forecasts. There is no reason to believe that the current $200 billion figure will not extend past 1950, McCoy said, indicating that the department does not expect a recession during the next two or more years.

On the basis of production so far in 1947, the Department anticipates output for the year to be from 62.6 to 64 million tons of finished products. This would indicate a shortage of from 2 to 6 million tons, the projected demand for the year indicated as being 67-68 million tons.

In the meantime, it is expected that some inventories will have been filled and supply will have caught up to demand in some lines. This would permit diversion to other fields, such as the automotive, of more steel than is currently being received.

Whether demand on a long range basis reaches the 80 million ton projection depends on many factors, it was pointed out, including the extent to which the United States participates in the rehabilitation of Europe.

Bureau Reports Value Of Iron, Steel Exports Had Doubled In May

Washington

• • • **Reflecting an** overall increase in United States exports during May of approximately $2 million, shipments to foreign countries of iron and steel semimanufactures gained steadily over April totals, the Bureau of the Census has reported. Total exports were valued at $1.4 billion, as compared with $1.2 billion in April.

Almost all commodities shared in the increased value in May exports over April, the Census Bureau said, while iron and steel, copper, and other items were about twice or more the May 1946 value. Exports of iron and steel semimanufactures were valued at $42.6 million, as compared with $39.5 million in April and $21.9 in May 1946. The $42.6 figure is broken down as follows: Iron and steel scrap, $.3 million; steel ingots, etc., $16.7 million; plates, sheets, etc., $14.6 million; tinplate and taggers' tin, $7.8 million.

Ferromanganese and other ferroalloys were valued at $.5 million in May 1947, while aluminum semimanufactures were valued at $3.3 million. Copper ingots, billets, plates and rods were valued at $4.6 million, and brass and bronze semimanufactures were valued at $1.3 million.

Show Electrolytic Manganese Superior In Some Stainless

Washington

• • • **A series of** 81 full-scale commercial heats of basic electric steel at the Timken Roller Bearing Co. plant at Canton has revealed several distinct advantages offered by electrolytic manganese over commercial low-carbon manganese in manuracture of some stainless steels, according to Dr. R. R. Sayres, Bureau of Mines director.

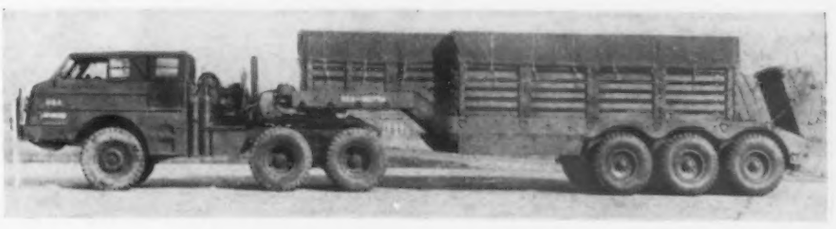
In a report now ready for distribution, it is disclosed that the average manganese recovery is higher, that absence of carbon in the electrolytic manganese offers an advantage in melting 18-10-plus columbian types, that it is easier to handle and store, and that additions to the furnace can be calculated and weighed more accurately when pure metal is used.

However, no difference in hot-workability, surface condition, or performance of the steel was noted, Dr. Sayre said.

More than 50,000 lbs of electrolytic manganese prepared in the Bureau's pilot plant in Nevada was used.

A complete copy of the report, "Report of Investigations 4078, Electrolytic Manganese in Stainless Steel," may be obtained free of charge from the Bureau of Mines, Washington, D. C.

SOME SEMI: *The Army T63 cargo semi-trailer, said to be the largest semi-trailer ever built is shown here with an Army M26 prime mover. The 60-ton trailer is built by Easton Car & Construction Co., Easton, Pa. With removable stake sides it will carry cargo, without them it can be used as a tank recovery vehicle.*



AFA Will Hold 1948 Foundry Congress In Philadelphia May 3-7

Chicago

• • • **The 1948 foundry** congress and show of American Foundrymen's Assn. will be held May 3-7 at Philadelphia, William W. Maloney, secretary-treasurer of the international technical society of the castings industry, has announced.

Philadelphia Convention Hall and the Commercial Museum will house the mammoth exhibit of foundry equipment, supplies and products and most of the sessions of the 52nd annual meeting of the 9700-member association. It will be the sixth convention in Philadelphia, where the AFA was organized in 1896.

Another record-breaking meeting is indicated by many factors, Mr. Maloney said. Foundrymen all over the world demonstrated their tremendous interest in latest technological developments at the recent meeting in Detroit, and at the convention and exhibit of 1946 in Cleveland, he pointed out.

"Many firms had not had time since the war's end to develop their new and improved products to the display stage for the Cleveland show," he said, adding, "By next May, these, and other products developed since, should be ready for exhibition to a worldwide castings industry audience."

This year, the interest of foundrymen from every corner of the American continent and from foreign castings centers in the AFA show and technical sessions, is expected to be stimulated by current trends: Growing indications of a coming buyer's market; increased mechanization in foundries, given impetus by personnel shortages; materials scarcities and substitutions, placing a premium on rigid control of practices and facilities; emphasis on good housekeeping practices, designed to make castings plants more attractive workplaces and attract young men into the industry.

Heading the convention committees will be Elbert C. Troy, vice-president in charge of research and development for Dodge Steel Co., chairman of AFA's Philadelphia group.

Named to AISI Committee

New York

• • • **C. A. Willson** has been appointed research engineer of the committee on reinforced concrete research, American Iron & Steel Institute, New York. He fills the vacancy created by the recent death of Roy Zipprodt.

For 19 years Mr. Willson served as structural engineer for the State Architect of Wisconsin, followed by service with governmental agencies.

To Study Merchant Iron

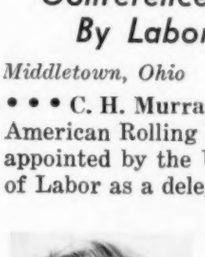
New York

• • • **John A. Claussen** has been engaged by the committee on merchant pig iron of American Iron & Steel Institute, New York, to devote his time to merchant pig iron. For many years he was active in selling pig iron in New York City, followed by service with governmental agencies.

Armco Official Named Conference Delegate By Labor Department

Middletown, Ohio

• • • **C. H. Murray**, vice president, American Rolling Mill Co., has been appointed by the U. S. Department of Labor as a delegate representing the iron and steel industry at the International Labor Conference, Stockholm, Sweden, Aug. 19 to Sept. 21.



C. H. Murray

Mr. Murray, who sails for Sweden Aug. 8, was recommended by the board of directors of the American Iron & Steel Institute and Earl Shreve, president, U. S. Chamber of Commerce, to serve as one of the two employer representatives at the iron and steel session of the ILO. This is Mr. Murray's second appointment to the International Labor Organization conference. He represented the steel industry last year in Cleveland.

ILO was organized in 1919 and was a part of the League of Nations. The United States became a member in 1934. It is financed by the governments of member nations.

Aim of the ILO is to improve industrial and employment security in all countries by drafting international legislation based upon research, discussion and conferences. The objective of this legislation has been to eliminate low working standards which adversely affect international trade relations. The ILO is composed of representatives of employers, workers, and government delegates.

This year, in addition to the United States, the following nations will send representatives: Australia, Belgium, Canada, China, France, United Kingdom, India, Italy, Luxembourg, Mexico, Sweden, Czechoslovakia and the Union of South Africa. Mr. Wilhelm Bjork of Sweden is the general chairman.

Coming Events

Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
Sept. 1-4 American Society of Mechanical Engineers, fall meeting, Salt Lake City.
Sept. 8-12 Instrument Society of America, conference, Chicago.
Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Dodge-Chicago Plant, Chicago.
Sept. 22-25 Assn. of Iron & Steel Engineers, annual meeting, Pittsburgh.
Sept. 29-Oct. 3 American Gas Assn., San Francisco.
Oct. 2-3 Gray Iron Founders' Society, annual convention, Milwaukee.
Oct. 6-7 Packaging Machinery Manufacturers Institute, annual meeting, Springfield.
Oct. 9-10 Porcelain Enamel Institute, annual meeting, Cleveland.
Oct. 16-17 National Conference on Industrial Hydraulics (formerly Hydraulics Machinery Conference), annual meeting, Chicago.
Oct. 18-24 National Metal Exposition, Chicago.
Oct. 30-Nov. 1 American Society of Tool Engineers, semi-annual meeting, Boston.
Oct. 31 Illinois Mining Institute, annual meeting, Springfield, Ill.
Nov. 7-8 Annual Conference on X-Ray and Electron Diffraction, Mellon Institute of Industrial Research, Pittsburgh.

Weekly Gallup Polls . . .

Truman Loses Some Support But Still Leads by Wide Margin

Princeton, N J.

• • • **President Truman's** general popularity with the voters has declined in the last 2 weeks, according to George Gallup, director, American Institute of Public Opinion.

But the drop from May has not been sharp.

In late May 57 pct of the nation's voters polled by the institute approved of the way Mr. Truman was handling his job as president. Today 54 pct say they approve, while 33 pct disapprove and the rest express no opinion.

Thus, 1 year before the 1948 nominating conventions, Truman in spite of his troubles with Congress continues to enjoy substantial support from the people.

Two powerful voting blocs account for a large part of his popularity and for the general strength of the Democratic party—labor union members and farmers. Among those two groups Truman's popularity is greater than among any other major groups in the population.

The President went to bat for organized labor by vetoing the Taft-Hartley act, expressing his opposition in vigorous language. Today's survey, which gives full reflection to the postveto mood of union labor, finds that as compared to May the President has held his own with this group, and if anything has gained a little.

In the case of farmers, the long period of farm prosperity undoubtedly has a great deal to do with the present popularity of the head of the administration in power.

During his 2 years in office, Mr. Truman has had rises and falls in popularity that resemble a ride on a roller coaster.

Starting in July, 1945, from the dizzying height of 87 pct—higher even than Franklin D. Roosevelt ever polled—he plummeted to 32 pct in the short space of 15 months. That low point coincided with the meat shortage of the summer and autumn of 1946, confusion over OPA and over foreign policy.

Then early in 1947 the President's popularity began to turn upward, partly as the result of his handling of John L. Lewis and of the new firmness with Russia. The rise continued through March, when the line again turned downward, sliding to the present 54 pct.

The trend follows:

"Do you approve or disapprove of the way Mr. Truman is handling his job as President?"

	Approve Pct	Disapprove Pct	No Opin. Pct
July 1945	87	3	10
Nov. 1945	82	9	9
Feb. 1946	63	22	15
July	43	45	12
Oct.	32	53	15
Jan. 1947	35	47	18
Feb.	48	39	13
Mar.	60	23	17
May	57	25	18
Today	54	33	13

The President's popularity with organized labor has likewise been an up-and-down affair, with labor reacting favorably toward him at the present time.

Following is the trend of sentiment among union members, and among another powerful voting bloc, the farmers of the country.

Percent Approving Truman

	Union Members Pct	Farmers Pct
Nov. 1945	84	82
Feb. 1946	71	66
July	41	50
Oct.	34	33
Feb. 1947	43	59
May	56	61
Today	58	61

• • • **The Democratic party** has made impressive gains in voting strength in recent months.

While A. M. Landon recently declared that Republicans stand a better than 2-to-1 chance to elect the next president, a survey by the institute finds that a sizable majority of voters say they would cast their ballots for the Democratic party—not the Republican—if a presidential election were held right now.

The trend of events in the next 12 months may substantially alter the situation. But as of this date

Democrats Lead Republicans; Dewey and Stassen Hold Top Popularity With Republicans

o o o

the Democratic party runs about as strongly as it did in the last presidential election. Its comeback from the low point of last November, when the party lost control of Congress to the Republicans, has been something of a major political feat. The question now is whether the gains will last.

The party's course is traced in the following table showing the trend of sentiment on the question:

"If a presidential election were being held today, which party would you vote for, the Democratic or Republican?"

	Major Party Vote Pct Dem.	Pct Rep.
1944 election	53.8	46.2
Aug. 1945	58	42
Dec. 1946	47	53
Feb. 1947	50	50
March	51	49
May	57	43
Today	55	45

The latest figure compares with 53.8 pct in the 1944 presidential election, when the late President Roosevelt defeated Thomas E. Dewey, and with 55 pct in 1940 when Roosevelt beat Wendell Willkie.

In analyzing the Democrats today two factors must be taken into account — (1) the basic strength of the party and (2) the popularity of President Truman. The presidential popularity index, based on the question, "Do you approve or disapprove of the way Mr. Truman is handling his job as president? is a widely fluctuating, almost mercurial index, reflecting changes of opinion based on day-to-day events or statements. In a short period of 2 years, for example, Mr. Truman's personal popularity as measured by that index has gone from 87 pct down to 32 pct and back up to 54 pct which is the figure today.

(CONTINUED ON PAGE 149)

Industry Okays 120,000 Tons of Tinplate For Export End of Year

Washington

• • • **A government-proposed** quota of 120,000 tons of tinplate to be supported by CXS ratings and scheduled for export during the last quarter of this year has been approved by the Tinplate Industry Advisory Committee at a meeting with representatives of the Office of Materials Distribution and the Office of International Trade, Dept. of Commerce.

An additional quota of 22,000 tons of tinplate would be licensed for export on a nonrated basis during the last quarter, OMD and OIT officials said.

The 120,000 tons to be rated will be used for food preservation abroad. Tin mills are required to accept orders for this amount. Acceptance of orders for the unrated 22,000 tons will be optional with producers. If all unrated orders are accepted, 10,000 tons will go to package food products to be shipped to this country, and 12,000 tons (2000 tons more than in the third quarter) for American Oil companies and for other nonfood uses abroad.

It was brought out in discussions that the OIT, after careful screening of foreign requests for tinplate, found that a minimum of 184,000 tons would be needed during the fourth quarter for the preservation of perishable foods, and that for this purpose and to meet other essential needs a total of 206,000 tons would be required. In view of domestic requirements, however, government officials said that it would be impossible to license the export of such quantities. The figure of 142,000 agreed on was reached after full deliberation by representatives of the Departments of State, Agriculture and Commerce, OMD said.

Frank T. McCue, chief of OMD's Tinplate Section and government presiding officer at the meeting, told committee members that he hoped they would enter the fourth quarter with a carryover of orders from previous quarters of not more than 15 pct of their scheduled export loads. Currently, the carryover figure is approximately 31,000 tons. This would have to be reduced by some 8000 tons by the end of September to meet the goal set by Mr. McCue.

Asked to report on possible retarding factors, industry members mentioned anticipated difficulties in shipping during the grain harvest movement, and in arrangements by foreign buyers for letters of credit.

Committee members said that recent idleness in coal fields had not seriously affected tinplate production, since this was given preference over other steel items because of its high importance in both the domestic and export markets.

Erwin Vogelsang, chief of the Tin, Lead, Zinc Section of OMD, supplied figures in the accompanying table on pig tin available and consumed in the United States during the first 6 months of 1947, and estimates for the last half of the year.

Mr. Vogelsang said he was not optimistic about the likelihood of any substantial increases in the amount of pig tin to become available in 1947, and that it would be late in 1948 before world demand and supply would approach a balance.

	Estimated Jan.-June (Tons)	Estimated June-Dec. (Tons)	Total 1947
Beginning Stocks:			
Office Metals Reserve	17,197	9,697	
Industry	14,837	15,000	
Total	32,034	24,697	
Production Tin Processing Corp.	17,356	15,450	32,806
Production Detinners	1,700	1,500	3,200
Imports	6,737	11,000	17,737
Total	25,793	27,900	53,693
Consumption:			
Tinplate	14,510	17,490	32,000
Other	18,620	19,000	37,620
Total	33,130	36,490	69,620
Ending Stocks:			
Office Metals Reserve	9,697	1,107	
Industry	15,000	15,000	
Total	24,697	16,107	

American Car And Foundry Backlogs At $250 Millions

New York

• • • **American Car** and Foundry Co. and subsidiaries have a backlog of more than $250 million, Charles J. Hardy, chairman of the board, revealed recently in reporting net earnings for the fiscal year ended April 30 at $5,176,042 against $5,346,689 in the previous fiscal year.

"The year closed with business on the books in excess of $229,000,000," Mr. Hardy told stockholders. "At this writing," he added, "the volume has expanded to somewhat more than $250,000,000."

In discussing the company's domestic business, Mr. Hardy said, "the railroads are keenly alive to the necessity of increasing and improving the amount and the quality of their rolling stock to meet the current and prospective demands, and are making strenuous efforts to that end. In such efforts your company is cooperating to the fullest extent of its ability, but is still hampered by the difficulty of obtaining from its suppliers the full quantity of the basic and other materials needed in its manufacturing operations."

Grand Coulee Gets 7th Of 18 Big Generators

Pittsburgh

• • • **A new 108,000 kw** generator has been completed by the Westinghouse Electric Corp., that will increase the generating capacity at Grand Coulee Dam by the equivalent of 146,000 hp. Working together with six similar Westinghouse machines—the world's largest waterwheel generators—already in operation, these could supply enough power to fill all the industrial and residential requirements of a city twice the size of Pittsburgh.

Eventually, the Grand Coulee program calls for 18 waterwheel generators, each of 108,000 kw capacity. This tremendous concentration of energy will be used for pumping irrigation water to 1,200,000 acres of arid farm land in the Columbia Basin of central Washington. It will also set up a huge reservoir of electric power for industrial use in the West.

The completion of the 238-ton stator was the final portion of the manufacturing job. Other parts of the generator have already been shipped to Grand Coulee. These included a 72-ton, 32-ft long steel shaft, and the 464-ton rotor.

AISI Says Auto Firms Got 14 Pct More Steel In First Third of '47

New York

• • • **In the first 4 months** in 1947 the automobile industry received 14 pct more finished steel than during the preceding 4 months, according to the American Iron & Steel Institute. Analysis also indicated that automobile companies received 14.6 pct of the total shipped in the first 4 months in 1947. This, the institute said, was slightly better than its share in 1941.

The total amount of steel products shipped to consumers in the first third of this year, 20,447,827 tons, compared to 19,333,786 tons shipped in the last 4 months of 1946.

Jobbers, dealers and distributors in the first third of this year received 3,461,794 tons, or 16.9 pct of the total shipped. Freight car builders during the first 4 months of this year received, according to the institute, 686,553 tons, which is said to be equivalent to steel requirements for 31,000 new domestic freight cars. These shipments were said to be 18 pct more than this group received in the previous 4 months.

Finished steel shipments destined for the oil and natural gas industry during the early months of 1947 were one third larger than during the final 4 months of 1946. The amount of steel shipped directly for export was 7 pct of the total steel shipments in the first third of this year, the institute said.

Construction received 9.6 pct of total steel, 8 pct went to steel for converting and processing, while rail transportation took 7.9 pct, machinery manufacturers received 5.3 pct, and contractors' products accounted for 3.7 pct of total shipments, electrical machinery and appartus consumed 2.6 pct, appliances, utensils and cutlery received 2.5 pct, and other domestic and commercial equipment accounted for 2.8 pct of total steel shipped in January, February, March and April of this year.

In the first 4 months of 1947, sheet and strip shipments to the auto industry totaled 1,856,815 tons. The auto industry's share of sheet and strip shipments amounted to 31.3 pct of total tonnage shipped, as against 27.8 pct in 1946.

AMERICAN IRON AND STEEL INSTITUTE
SHIPMENTS OF STEEL PRODUCTS
ALL GRADES INCLUDING ALLOY AND STAINLESS
(Net Tons)

MAY - 1947 (Month)

Steel Products	Number of companies	Items	Current Month: Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Current Month: Per cent of Total Shipments	Current Month: Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	To Date This Year: Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	To Date This Year: Per cent of Total Shipments	To Date This Year: Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Whole Year 1946: Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products For Resale) (Net Tons)	Whole Year 1946: Per cent of Total Shipments	Whole Year 1946: Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	227,755	4.2	210,858	1,091,156	4.2	914,814	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	382,345	7.0	334	1,859,768	7.2	1,409	3,474,284	7.1	5,399
Steel piling	3	3	25,547	0.5	-	133,285	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	578,773	10.6	14,726	2,571,988	9.9	90,803	4,152,181	8.5	250,709
Skelp	6	5	11,764	0.2	35,670	70,155	0.3	164,184	227,033	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	183,207	3.4	9	929,014	3.6	264	1,790,311	3.7	4,890
—All other	5	7	20,490	0.4	-39	78,798	0.3	167	144,999	0.3	426
Joint bars	7	8	14,617	0.3	1,615	78,465	0.3	6,222	176,803	0.4	5,327
Tie plates	8	9	46,441	0.8	499	207,383	0.8	2,858	447,496	0.9	18,700
Track spikes	8	10	15,186	0.3	-	75,804	0.3	54	146,194	0.3	693
Hot Rolled Bars—Carbon	33	11	561,134	10.3	71,157	2,665,425	10.3	334,704	5,006,859	10.3	707,991
—Reinforcing—New billet	16	12	97,158	1.8	659	507,854	2.0	3,692	1,048,483	2.1	7,381
—Rerolled	11	13	16,330	0.3	-	62,881	0.2	-	141,346	0.3	1,267
—Alloy	26	14	158,936	2.9	17,217	755,751	2.9	90,522	1,390,278	2.8	138,395
—Total	44	15	833,558	15.3	89,033	3,991,911	15.4	428,918	7,586,966	15.5	855,034
Cold Finished Bars—Carbon	29	16	130,464	2.4	1,035	672,078	2.6	3,651	1,316,579	2.7	2,428
—Alloy	26	17	20,194	0.4	136	109,615	0.4	710	196,237	0.4	1,725
—Total	35	18	150,658	2.8	1,171	781,693	3.0	4,361	1,512,816	3.1	4,153
Tool steel bars	19	19	8,230	0.1	497	41,503	0.2	2,228	96,020	0.2	371
Pipe & Tubes—Butt weld	15	20	156,758	2.9	6,709	* 685,638	2.6	27,283	1,276,289	2.6	45,393
—Lap weld	8	21	35,997	0.7	69	169,660	0.6	625	305,516	0.6	238
—Electric weld	11	22	91,207	1.7	126	* 399,142	1.5	* 980	674,459	1.4	591
—Seamless	10	23	182,022	3.3	11,299	* 870,529	3.4	61,303	1,871,540	3.8	83,441
—Conduit	7	24	13,488	0.2	765	* 56,778	0.2	* 3,464	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	55,782	1.0	2,585	* 272,856	1.0	8,650	429,180	0.9	3,478
Wire rods	22	26	63,516	1.2	24,002	271,296	1.0	135,029	679,998	1.4	346,506
Wire—Drawn	38	27	219,708	4.0	14,670	*1,070,473	4.1	* 76,382	1,933,124	4.0	135,592
—Nails and staples	18	28	69,566	1.3	1,451	363,948	1.4	3,834	636,632	1.3	797
—Barbed and twisted	15	29	23,368	0.4	5	104,067	0.4	13	207,610	0.4	-
—Woven wire fence	13	30	37,632	0.7	306	175,572	0.7	1,628	383,230	0.8	-
—Bale ties	12	31	11,053	0.2	-	51,375	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	63,539	1.2	254	351,372	1.4	1,237	781,167	1.6	3,179
—Chemically treated	8	33	568	-	-	14,161	0.1	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	168,178	3.1	-	800,182	3.1	228	1,924,657	3.9	-
—Electrolytic	9	35	137,109	2.5	-	592,850	2.3	529	909,173	1.9	-
Sheets—Hot rolled	30	36	613,519	11.3	50,984	2,992,669	11.6	250,719	5,521,463	11.3	421,198
—Cold rolled	17	37	474,171	8.7	2,777	2,226,447	8.6	10,273	4,075,554	8.4	3,397
—Galvanized	16	38	135,790	2.5	60	661,260	2.6	189	1,462,053	3.0	1,725
—Electrical and enameling	10	39	50,297	0.9	-	234,472	0.9	307	435,170	0.9	-
Strip—Hot rolled	23	40	150,433	2.8	22,880	727,585	2.8	125,304	1,363,812	2.8	237,176
—Cold rolled	34	41	141,973	2.6	2,399	* 674,939	2.6	12,920	1,282,146	2.6	25,904
Wheels (car, rolled steel)	5	42	33,020	0.6	-	156,277	0.6	2	252,308	0.5	348
Axles	5	43	15,078	0.3	-	74,365	0.3	53	130,461	0.3	221
All other	-	44	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	141	45	5,442,343	100.0	495,714	*25,908,836	100.0	*2,337,257	48,775,532	100.0	4,297,889

During 1946 the companies included above represented 99.5 % of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Adjusted.

Industrial Briefs . . .

• TO BUILD FACTORY — The Standard Tube Co. will erect a brick and steel frame factory at the approximate cost of $875,000. Plans call for a floor area of 142,000 sq ft. The company is to begin production of its product, electrical resistance welded steel tubing, about Nov. 15, 1947.

• MAGNESIUM OXIDE—General Electric Co. has completed at Pittsfield, Mass., a plant for the manufacture of magnesium oxide which will provide about 10,000 sq ft additional space and double the company's output. It is equipped to purify, densify and grind crude magnesium oxide.

• FOR SALE—WAA is offering for sale the $46 million government surplus Wright Aeronautical Corp. plant at Lockland, Ohio, with a closing date of Aug. 7, including a magnesium foundry and two aluminum foundries.

• RAILROAD CONSTRUCTION — General-Shea Pacific has been awarded a $2,300,000 contract to construct 52 miles of standard gauge railroad for Kaiser Co., Inc., in Riverside County, Calif., which will connect Kaiser Steel's new Eagle Mountain iron ore mine with the Southern Pacific main line near the Salton Sea.

• ARISTOLOY—The Flint Steel Corp., of Tulsa, Oklahoma, announces that it is now warehousing Aristoloy alloy steel bars. Aristoloy is the trade name of electric furnace steels produced by the Copperweld Steel Co., Warren, Ohio.

• CONSOLIDATION — Cleaver-Brooks Co., Milwaukee, boilers, tank car heaters and industrial burners, has consolidated all production, sales and engineering activity under one roof at 326 E. Keefe Ave.

• BUILDS WAREHOUSE — Wheeling Corrugating Co., Wheeling, W. Va., has built a new warehouse at Louisville, for stocks of Wheeling sheets and fabricated products. The building is completely equipped for manufacture of galvanized corrugated culvert pipe of 8 in. to 84 in. in diameter.

• PURCHASES PLANT — Barium Steel Corp. announces the purchase of the plant and other physical assets including the inventories of the George King Co., Inc., producers of iron and steel castings at Sheffield, Ala. The King plant and business hereafter will be operated by and under the name of the Sheffield Iron & Steel Co., a Barium subsidiary.

• NEW OFFICE—The Ziv Steel & Wire Co., national warehousers of tool steels, have opened a new sales office in Dayton. Mr. Harold Barrett has been appointed manager of the new office and will handle the regular lines of carbon, alloy, high speed, tool and die steel.

• SALES OFFICE MOVED—American Welding & Mfg. Co., Warren, Ohio, has announced that the eastern district offices of the company will be transferred July 21, from 500 Fifth Ave., New York, to Industrial Bldg., 1060 Broad St., Newark 2, N. J. Frank J. Shanaberg has been named eastern district sales manager.

• ELECTRIC APPLIANCES — The Yale & Towne Mfg. Co. has entered the electric appliance field and is manufacturing electric irons at its local plant.

• TO BUILD WAREHOUSE—Work has been started on a $400,000 parts warehouse for the United Motors Service Div. of General Motors in Buffalo. The division's zone, sales and administrative offices will also be housed in the new building.

U. S. Coal Exports Exceed 1946 Rate In First Four Months

Pittsburgh

• • • **Coal exports** from the United States during the first four months of 1947 were substantially above those during the same period of 1946, totalling 15,103,488 from January through April, 1947. During that period of 1946 there were 11,319,783 net tons. Coke and briquet exports for the same periods totalled 613,642 in 1947 and 50,131 in 1946. The Bureau of Mines, just released statistics for the first four months of 1947.

Canada received the greatest amount of the coal and coke. In 1947, through April, exports to Canada were 4,378,000 tons of coal and 371,664 tons of coke, against comparable 1946 shipments of 3,658,863 tons of coal and 50,131 tons of coke. In 1946, Canada was the only recipient of coke from the United States.

South American countries during the stated periods received 853,661 tons of coal and 11,256 tons of coke in 1947 and 746,318 tons of coal and no coke in 1946. Brazil got 607,651 tons of the South American coal shipments in 1947, while Argentina got 196,667 tons. In 1946, Brazil got 461,280 tons of coal and Argentina got 211,228 tons during the same period.

Shipments to Europe through April, 1947, totalled 2,275,989 tons and in the 1946 period they were 2,108,304 tons. France, Italy and the Netherlands got the bulk of the coal during both years. Shipments to these countries were:

	January through April	
	1947	1946
France	2,542,552	2,058,468
Italy	2,275,989	2,108,304
Netherlands	1,063,270	550,117

Finland, Yugoslavia and Greece were the only countries in Europe that received less coal from the United States during the first four months of 1947 than during the same period of 1946. Sweden got the bulk of the coke shipped to Europe, 184,468 tons, out of total shipments of 222,092 tons. Coal shipments to Asia during the designated period in 1947 were 230,834 tons against none in 1946, and to Africa were 672,112 net tons in 1947, against 339,594 tons in January through April, 1946.

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

5000 Tons, Philadelphia, Market St. subway extension, City of Philadelphia, to George H. Flinn Corp., New York.

1900 Tons, Belleview, Neb., power station for Central Nebraska Power Co. to Paxton & Vierling Iron Works, Carter Lake, Iowa.

1750 Tons, Decatur, Neb., bridge to Bethlehem Steel Co., Bethlehem.

1600 Tons, Greenfield, Mass., bridge over Connecticut River, Massachusetts Dept. of Public Works, to Phoenix Bridge Co., Phoenixville, Pa.

300 Tons, Yarmouth, Me., state bridge to Bethlehem Steel Co., Bethlehem.

235 Tons, Pottsville, Pa., Aetna Steel Products Co., through Truscon Steel Co., Cleveland, to Belmont Iron Works, Philadelphia.

220 Tons, York, Pa., York Corp., addition to warehouse, to Bethlehem Steel Co., Bethlehem.

• • • **Fabricated steel inquiries** this week included the following:

2125 Tons, Oakland, Calif., overhead crossing of Southern Pacific R. R. California Div. of Highways.

1465 Tons, Santa Barbara, Calif., overhead crossing of Southern Pacific tracks, California Div. of Highways.

1200 Tons, Nebraska, beam spans, federal aid project F-194, State of Nebraska, bids close July 14.

780 Tons, Kern County, Calif., two bridges across Tehachapi Creek and two combined bridge and overhead structures across Tehachapi Creek, California Div. of Highways.

460 Tons, Thompson Falls, Mont., truss bridge for the Northern Pacific R.R. Co.

150 Tons, San Mateo County, Calif., South Creek, California Div. of Highways. of Colma Creek, California Div. of Highways.

• • • **Reinforcing bar awards** this week included the following:

600 Tons, Rapid City, S. D., hangar for U. S. Army air base, through Steenberg Construction Co., St. Paul, Minn., to Joseph T. Ryerson & Son, Inc., Chicago.

600 Tons, Miles City, Mont., veterans' hospital, Leao & Leighland Co., low bidder.

275 Tons, Urbana, Ill., chemistry and chemical building, University of Illinois, John Felney Co., Bloomington, Ill., low bidder.

• • • **Reinforcing bar inquiries** this week included the following:

315 Tons, Oakland, Calif., overhead structure over Southern Pacific R.R., California Div. of Highways.

240 Tons, Santa Barbara, Calif., overhead crossing of Southern Pacific tracks, California Div. of Highways.

160 Tons, Kern County, Calif., two bridges across Tehachapi Creek and two combined bridge and overhead structures across Tehachapi Creek, California Div. of Highways.

115 Tons, San Mateo County, California. South of Colma Creek, California Div. of Highways.

100 Tons, Santa Fe Dam, Los Angeles County, Calif., Los Angeles District Corps of Engineers.

• • • **Railroad awards** this week included the following:

The Pennsylvania R.R. is buying 20 diesel electric locomotives for delivery in 1 year, Baldwin Locomotive Co. to build eight. The B. & O. R.R. has ordered 20 diesel electrics from the Electro-Motive Div. of General Motors Corp. for delivery in early 1948. The Elgin, Joliet & Eastern R.R. has ordered 1000 cars, 500 50-ton box cars from Magor Car Corp., 400 48-ft gondolas from Ralston Steel Car Co. and 100 65-ft gondolas from the Greenville Steel Car Co. The Illinois Central will build in its own shop 1500 50-ton hopper cars and 1500 50-ton box cars. The Chicago & Eastern Illinois R.R. has ordered from American Car & Foundry Co. in Madison, 300 50-ton hopper cars.

C & O Railway Awards Contracts for New Low-Level Coal Pier

Cleveland

• • • **Chesapeake & Ohio** Railway has awarded contracts to Alliance Machine Co., Alliance, Ohio, for steel towers costing approximately $1,400,000 and to the Link Belt Co., Philadelphia, for dumpers and conveyers costing approximately $1,600,000 for the new low-level coal pier now under construction at Newport News, Va.

According to C&O officials, the new pier will be capable of dumping a maximum of 6000 tons an hr and loading four ships at the same time by use of the belt conveyer system and dumping towers.

The four movable towers which will be made by Alliance Machine Co. will be mounted on as many tracks and fed by separate belt conveyers at a maximum rate of 1500 tons each per hr.

Conveyers are 5 ft wide, made of 8-ply fabric with runner covering and have a combined length of more than 2 miles.

Towers may be moved from hatch to hatch, making it unnecessary to move the ship from the time it reaches the loading pier until it is fully loaded. When loaded from a stationary dumper, ships must be towed by tugs at intervals until each hatch has been brought beneath the dumper.

Mobility of towers also will permit the loading of one hatch in each of four ships or two hatches in each of two ships at the same time, effecting a material saving in loading time.

Coal Burning Turbine Locomotive Developed By C & O and Baldwin

Cleveland

• • • **The world's largest** passenger locomotive, a unique type that converts coal into electrical energy for its wheel drive, will be delivered to the Chesapeake & Ohio Railway in August.

Robert J. Bowman, C & O president, said the locomotive, the first steam turbine locomotive ever built, is one of three 6000 hp prime movers having a top speed of 100 mph.

The locomotive was placed on public exhibition for the first time at the Association of American Railroads convention held on June 23 at Atlantic City. Thereafter, it started test runs.

The steam turbine-electric was born of the C&O program to develop more effective use of bituminous coal, which accounts for more than 90 pct of the railroad's freight revenue.

Design was worked out by the C&O mechanical department and the Baldwin Locomotive Works, the builder. It combines three well-tested principles, those of the steam boiler, the steam turbine and electric drive.

In arrangement, the steam turbine-electric locomotive reverses customary design. Constructed as a single unit 90½ ft long, it houses a 29¼-ton coal compartment in its streamlined nose. The operating cab is between the coal compartment and the boiler, and has windows on each side, facing ahead. It is equipped with swivel seats for the engineer and fireman. Both the operating cab and power unit cab are constructed of aluminum.

Coupled to the locomotive is a 25,000-gal water tender. Wheelbase of the locomotive and tender measures 140 ft, 3¾ in. The weight of the engine alone is 411½ tons. It is the largest in any type of service east of the Mississippi, and the largest single-unit engine in use anywhere.

Coal is stoked automatically into a 310-lb pressure boiler, which generates steam that is superheated and introduced into the 6,000-hp turbine. The turbine is geared down to two main generators having a combined capacity of 4,000 kw-hr of electrical energy.

MACHINE TOOLS

. . . News and Market Activities

Improvement Seen in July in New Machine Tool Orders

• • • **Proving once** more that price increases help drive in business, new firm orders for machine tools in July are expected to show some improvement over June levels, according to reliable sources in the industry.

While business is not of boom proportions in any particular sector, machine tools are being sold in sufficient numbers to inspire the comment that business is holding up.

At the same time, price increases are being announced by more companies and in many cases without giving dealers or customers the 10-day grace period on outstanding quotations.

In Detroit, a considerable amount of buying of special tools continues although the industry as a whole is on the quiet side. The latest report of a price increase of 15 pct by a Cincinnati machine tool builder adds one more to the growing list of machine tool makers who have jumped their prices in recent months.

A large General Motors plant in Saginaw is reported to have completely redesigned a job and is asking for new quotations. Trade sources now report that a large tooling program for automatic transmission division of Borg-Warner is now cancelled out. It was originally expected that this plant would build automatic transmissions for Ford.

Indications are now that completely new tooling will be required for V-8 engines for new models of Oldsmobile, Pontiac and Buick. A great deal of emphasis on transfer machines is expected in placing orders for the required tooling for these jobs.

Predictions here are that the tool industry in Detroit will be very busy for several months following the showing of new machine tools at Chicago.

In Cincinnati, net earnings of $313,417 for the second quarter ended June 14 were reported by Cincinnati Milling Machine Co. Net is after estimated federal income taxes of $168,961 and is

More Companies Announce Price Increases Sometimes Without 10-Day Grace Period

o o o

equal to 32¢ a share after preferred dividends. Directors of the company declared a dividend of 35¢ a share on common stock and the regular quarterly dividend of $1 on preferred shares, both payable Sept. 1. First quarter earnings were $346,615 or 35¢ a share, making a total income for the first 6 months of $660,032 or 67¢ per common share.

First quarter earnings for Cincinnati Milling Machine Co. in 1946 were $550,300 and second quarter of $464,114, or a total of $1,014,414 for the half year. Dividends were $1 a common share for one half year.

Articles of incorporation were filed in Columbus, Ohio, this week for the Norwood Special Machine Products, Inc. Norwood is buying the old I & S Machine shop. D. W. Bercaw is one of the incorporators and the president of the new corporation, which will engage in services to other machine tool companies including stampings, lathe work and other operations.

Elsewhere deliveries of electrical equipment for industrial applications, while generally showing improvement, are not yet to the point that long term production scheduling on the part of manufacturing consumers is unnecessary. Fractional horsepower motors, which 3 months ago were showing an 18-month delivery, are now being sold on 20 months' delivery. The backlog of 18 months in March represented a total gain from a 24-months' backlog at the turn of the year.

Standard machine controls have become a stock item. About 70 to 80 pct of the full line of standard electrical controls for machinery and machine tools are in stock and can be sold off the shelf. The remainder are running up to 3 months' backlog. Engineered or special controls are still running 35 to 37 weeks on delivery, which is considerably improved during the past 3 months but still not much help to the buyer.

War Assets Administration has come up with a clever idea, a plan to extend credit to machine tools to certain foreign countries. As a case in point, France was granted a $50 million credit, but it has not yet been decided who will select the machines for the French and who will get them after their arrival in France. A conference was held on this idea, and if WAA needs assistance in selecting the tools, it seems likely that the industry might provide the personnel.

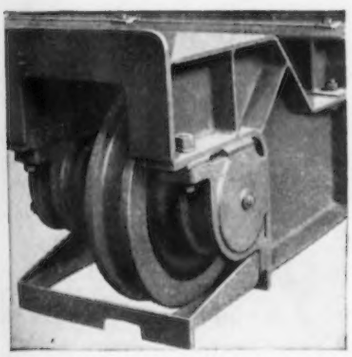
Joint Army, Navy Machine and Tool now has about 15,000 machine tools under shipping instructions, or about one tenth of their alleged requirements. Latest instructions to zone administrators and regional directors of WAA point out that the tagging of machine tools will not be restricted to tools which have been offered for sale.

"Except for those tools which must be advertised to clear priorities, any tools in sites designated for JANMAT activities may be tagged whether or not they have been offered for sale."

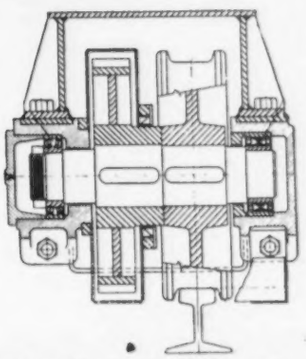
However, machine tools which have been earmarked for the military reserve may be sold to prospective buyers who certify for purchases for bona fide production in the domestic economy, providing shipping instructions have not been received from the services.

New Englanders are interested in efforts of Argentina's banking authorities to restrict imports, apparently directed toward conserving dollar exchange heretofore expended for machinery and productive goods. Argentina has been one of the most productive fields for United States export toolmakers. It is actually hungry for our tools, preferring them to English. It also is vitally interested in plastic machinery. A Worcester machine tool firm has been shipping far more plastic tools to Argentina than machine tools.

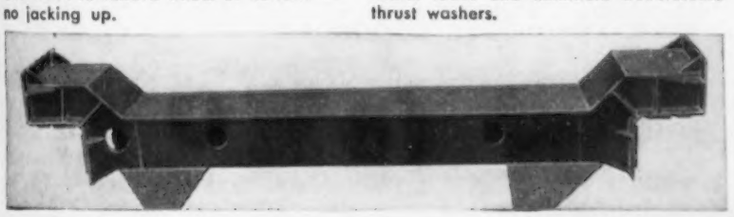
They Reduce and Simplify Maintenance!



1. **EASIER WHEEL REMOVAL** due to true MCB design. Simply drive wedges under end truck to relieve wheel of its load — no jacking up.



2. **NO END THRUST WASHERS.** Roller bearings take end thrust loads as well as radial loads and eliminate troublesome thrust washers.



3. **DOUBLE WEB BOX CONSTRUCTION** provides greater lateral stability. Heavy bearing seats, rigidly reinforced, take all impacts from starting and stopping.

MCB End Trucks are only one of many added values —mechanical and electrical —that are yours in P&H Cranes. Can we help you solve an overhead materials-handling problem?

P&H
HARNISCHFEGER
CORPORATION
ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

ELECTRIC
OVERHEAD CRANES
4401 West National Avenue
Milwaukee 14, Wisconsin

NONFERROUS METALS

. . . News and Market Activities

Zinc

• • • **The zinc market** is quiet with certain grades in oversupply at this time. Orders for High Grade and Brass Special have been considerably reduced by the vacation periods of the brass mills and the reduction of their order volume. The former grade is one that was used in very large tonnages during the war for cartridge brass. Since the end of the war it has not been in heavy demand. As the result of the unbalanced relationship among zinc grades some producers are reported to have been altering their operations to permit the production of larger tonnages of grades in heavy demand at the expense of the others. Some producers are reported to have begun to debase a part of their production to bring High Grade down to the equivalent of Brass Special or Prime Western. It is understood that consumers have been able to obtain all their requirements of the two grades in shortest supply—Prime Western and Special High Grade. Speculating on the effect of futures trading which began this week on the zinc market, producers are under the impression that there will be no immediate market reaction, although it is the general impression among the trade that futures prices will be well below current market prices.

•

Copper

• • • **There is some** possibility of a strike at Smelters and Refineries at the end of this month due to stiffened resistance of management to the demands of the International Union of Mine, Mill and Smelters Workers Union at the plants of the Phelps Dodge Refining Co., American Smelting and Refining Co. and Kennecott Copper Co. according to reports in the trade. Anaconda Copper Co. and American Metal Co. have already worked out settlements with the union but the other producers are operating on a 30-day extension of contract.

Some market factors are of the opinion that a strike would have an inflationary effect on copper prices which might be expected to continue for some time after a settlement is reached with all producers. Barring a strike however it is certain that all market factors favor a gradual decline in copper prices. The domestic market is rather quiet. Except for the tonnage sought by Italy, there is little foreign inquiry and the export price is reported to have dropped to below the equivalent of 21¢ f.a.s. New York and later had strengthened to that figure. The current relative weakness in the export market is largely due to the lack of dollar holdings abroad. Chilean producers, confronted with the decline in foreign interest, have been considering further diversion of their copper production to fill domestic demand. In general however fire refined copper is not as acceptable as electrolytic to the U. S. market.

•

Set Tin, Antimony Control

Washington

• • • **Domestic controls** on tin and tin products and all existing controls on antimony were continued until Mar. 1, 1948, under legislation signed by the President last week. The new law removed import controls on tin ores and concentrates. Overall export controls were also continued and priority power to direct exports in support of foreign policy aims was placed in the hands of the Secretary of Commerce. Commerce will also administer practically all other portions of the new law which extended remnants of the Second War Powers and Export Control Acts. ODT's emergency powers affecting rail carriers were also extended. In signing the measure, the President stated that it would probably be necessary to request a further extension of the export powers before the expiration date set in the new law.

•

Lead

• • • **Although the** former pressure for delivery of lead is no longer as acute as it was as recently as a month ago, the threat of strikes at the smelters and refineries of the American Smelting and Refining Co. and at St. Joseph Lead Co. operations is causing concern to consumers. Prices of lead may be expected to hold firm at current high levels pending clarification of the wage dispute. At the present time producers are able to supply the full requirements of practically every consumer.

•

Mexico Raises Duty

Washington

• • • **Worldwide dollar** shortages last week forced Mexico to increase duty rates on copper, tin and aluminum products imported from the United States. Increases range from one tenth of one peso per gross kilogram for copper to 1.50 pesos per legal kilogram for manufactures of tin, antimony, lead and zinc. At the same time, Mexico placed a duty rate of 2.50 pesos per legal kilogram on pipes opened lengthwise, an item previously free from duty.

Scrap Market Firmer

• • • **While the market** for nonferrous metals continues quiet and relatively inactive there is a firmer tone to the market which has not yet been reflected in increased prices over those of several weeks ago. Most of the buying interest reflects the activity of refineries as custom smelters are reported not to have reentered the market in appreciable volume. It may be expected that prices must advance if the trend continues.

Nonferrous Metals Prices

Cents per pound

	July 16	July 17	July 18	July 19	July 21	July 22
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb)	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$17.00
Beryllium aluminum, 5% Be; dollars per lb contained Be	$35.50
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper, electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$85.00 to $87.00
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$53 to $56
Silver, New York, cents per oz.	64.75
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	18.00
No. 120	17.50
No. 123	17.00
80-10-10 ingot	
No. 305	22.00
No. 315	20.00
88-10-2 ingot	
No. 210	27.75
No. 215	26.25
No. 245	20.25
Yellow ingot	
No. 405	14.50
Manganese Bronze	
No. 421	16.50

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75
0.60 copper, max.	15.50
Piston alloys (No. 122 type)	13.75
No. 12 alum. (No. 2 grade)	13.25
108 alloy	13.50
195 alloy	14.25
AXS-679	13.75
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-97½ pct	14.50
Grade 2—92 pct-95 pct	12.50
Grade 3—90 pct-92 pct	11.75
Grade 4—85 pct-90 pct	11.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, Cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 89 pct, crystals, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb. f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75.

Round Rod: M, diam, in., ¼ to ⅜, 47¢; ½ to ¾, 45¢; 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢ 38 to 40, 75.5¢ 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ¾, $1.12; ⅜ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢ 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per pound, f.o.b. mill effective June 11)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14¼
Loose yellow brass trimmings	15⅛

Copper and Brass

No. 1 heavy copper and wire	14½—15
No. 2 heavy copper and wire	13½—14
Light copper	12½—13
Auto radiators (unsweated)	8½— 9
No. 1 composition	10½—11
No. 1 composition turnings	10 —10½
Clean red car boxes	9 — 9½
Cocks and faucets	9 — 9½
Mixed heavy yellow brass	7 — 7¼
Old rolled brass	7 — 7¼
Brass pipe	8½— 9
New soft brass clippings	10½—11
Brass rod ends	9½—10
No. 1 brass rod turnings	8½— 9

Aluminum

Alum. pistons free of struts	4 — 4½
Aluminum crankcases	5 — 5½
2S aluminum clippings	7 — 7½
Old sheet & utensils	5½— 6
Mixed borings and turnings	—2
Misc. cast aluminum	5 — 5½
Dural clips (24S)	5 — 5½

Zinc

New zinc clippings	6 — 6½
Old zinc	4¼— 4½
Zinc routings	1½— 2
Old die cast scrap	2½— 3

Nickel and Monel

Pure nickel clippings	15½—17½
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	17 —18
New Monel clippings	10 —10½
Clean Monel turnings	7 — 8
Old sheet Monel	9½—10
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
German silver clippings, mixed	7½— 8
German silver turnings, mixed	5½— 6

Lead

Soft scrap lead	10 —10½
Battery plates (dry)	5 — 5½

Magnesium Alloys

Segregated solids	8
Castings	5

Miscellaneous

Block tin	63 —65
No. 1 pewter	50 —52
No. 1 auto babbitt	38 —40
Mixed common babbitt	11½—12
Solder joints	12 —13
Siphon tops	38 —39
Small foundry type	13 —13½
Monotype	12 —12½
Lino and stereotype	11½—12
Electrotype	10 —10½
New type shell cuttings	10½—11
Clean hand picked type shells	4½— 5
Lino and stereo dross	5 — 5½
Electro dross	3 — 3¼

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50

SCRAP

. . . News and Market Activities

Scrap Prices Hit Alltime High This Week

• • • **The average price** of heavy melting scrap at Pittsburgh, Philadelphia and Chicago this week reached an alltime high in steel mill history. THE IRON AGE steel scrap price composite this week is up $2.25 a gross ton to a record of $40.00 a gross ton.

This new price is 33¢ a ton above the previous high of $39.67 a gross ton made on Mar. 18 this year. Since the low of this year reached on May 20 when the average price of scrap dropped to $29.50 a gross ton the price has now advanced $10.50 a gross ton.

Yet with the high prices made this week brokers and consumers alike are afraid that quotations will go higher. Already some brokers are paying the quoted price to cover on old and new orders.

The price at Pittsburgh this week, where heavy melting advanced $1.50 a ton, is believed to be the highest since regular quotations have been reported. No. 1 at Pittsburgh this week is quotable at $40.00 to $40.50 a gross ton. The same price prevails at Chicago where No. 1 steel scrap has gone up $3.50 a ton since last week. Philadelphia shows a rise this week of $1.75 a ton on heavy melting steel scrap.

While there has been talk of a $50.00 scrap market there was no way of telling this week if the price would go that high. It was true that supplies were far from adequate over a long period but for the time being most consumers are getting what they want—if they pay.

•

PITTSBURGH—Brokers and consumers in this area have the jitters at the new high price of local scrap. Ranging from $40 to $40.50 a ton, local scrap hit a new all-time peak this week. Mills are leery of buying, brokers are hesitant to sell at any price, and tie-in sales are booming the price above quoted figures. Consumers hesitate to place orders even at present prices, knowing full well that unless the seller is ready to ship immediately, the chances of getting the scrap are not too good. There is a unanimous conviction that scrap prices are still on their way up, and talk of $50 openhearth and $40 blast furnace scrap is prevalent. No one has much to say about current market conditions except that the price is too high, but no one knows how to break it. On the other hand, despite the alleged shortage of scrap, no mills have furnaces off for lack of scrap. This proves only that price is still the main factor in scrap. The Pennsylvania list had not been released at press time but observers are of the opinion that a bid of $43 would not be adequate for railroad heavy melting.

•

CHICAGO—Higher prices paid last week brought local prices to about the same level as that offered a week ago for out-of-district material. There are indications that the mills are attempting to buy as much tonnage as possible and then get out of the market. When the new orders were first placed there was some confusion as it was indicated the $39.50 price covered all openhearth scrap. However, dollar premiums for No. 1 industrial steel have now been paid.

•

PHILADELPHIA—The market showed further strength here last week with price advances recorded in most grades. Heavy melting grades are being sold to consumers at $40. Brokers are pessimistically viewing the rising market and anticipating that the upward trend might not be able to be brought under control.

•

NEW YORK—Brokers in this market continue to pay last week's price for heavy melting grades, but price increases are registered in turnings and cast scrap. Last week's quoted price for compressed galvanized bundles was $2 above the market price of $31.50 to $32.00 which continues this week.

•

DETROIT — Descriptions of scrap market conditions in Detroit this week varied from "chaotic" to "the wildest I can remember." Large mill buyers were still paying $35 for openhearth scrap on old orders but sales of low phos plate to be used for conversion steel were bringing prices as much as $4 and $5 over this. Two facts had emerged from the flood of unconfirmed reports of zooming scrap prices: No large Detroit mills were yet paying the stratospheric prices that were being talked about and Detroit mills were not getting enough scrap at present prices to keep operating at present rates. No one was buying cast iron grades in substantial quantities this week but prices were holding at $40.

•

CLEVELAND—Much confusion spiked with rumors surrounds the scrap market here and in the Valley. According to reports, brokers are now paying more than $40 to cover on old, low priced orders. Dealers are shying away from orders, and shipments to consumers are showing it. New orders are expected at almost any time, and some quarters believe that higher orders are out already, giving some brokers a chance to keep their buying prices down on some grades temporarily at least. The market is tremendously strong, with all grades, cast and the railroad specialties jumping.

•

BOSTON—Yard stocks are small and prices are stronger, stimulated by renewed mill inquiries and broker bids. Most current bids for No. 2 steel are $33.50 a ton, but $34 has been done in a small way. Some busheling will fetch more than No. 2 steel. Shoveling turnings are moving at $28.50, and machine shop at $26.50. Limited sales of machinery cast have been made at $45 to $47 delivered, or $40 to $45 f.o.b. Pennsylvania is bidding $38 f.o.b. for heavy breakable and a local concern $35 without success.

•

BUFFALO—Competitive bidding gave the market increased strength this week and prophets of higher prices were in good voice. Mill prices for local scrap were unchanged, but Pittsburgh brokers were paying on the basis of $40.00 delivered Buffalo. In the farther reaches of the district, the $40.00 figure represents a price of $36.75 at Syracuse, for instance, and $42.25 laid down in the smoky city. Brokers in Buffalo as elsewhere, took it on the chin. Some had to cover sales made as low as $30.00 at the full advance.

•

ST. LOUIS—Consumers of scrap iron in the St. Louis industrial district have increased their buying prices from $1 to as much as $6 a ton but brokers are paying even more than the consumers will pay as is evidenced by the high prices that railroad lists are bringing. Brokers are said to be speculating with the idea that the mills will be forced to pay the higher prices that will be required to give them a profit. Competition from outside markets continues to cut into the supplies that should come to this district.

•

CINCINNATI—The scrap iron and steel market here this week is reported strong with prices climbing. While the supply is far from adequate as reported by dealers and brokers, mills are buying what they can in an effort to build inventories. However there is not much to offer.

•

BIRMINGAM—Scrap is tight here and practically unavailable in anticipation of further price increase. The market is disorganized. Sales into consumption this past week raised heavy melting to a quotation of $35.50 to $36.00 a ton.

•

TORONTO — While scrap iron and steel in Canada is still in serious short supply there has been some easing in the situation as a result of heavy imports. At this time Canada's stocks of scrap iron and steel are sufficient for only about a month, and domestic sources are providing only about 25 pct of total requirements, outside the scrap made in consumers' own plants.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 heavy melting	$40.00 to $40.50
RR. hvy. melting	41.00 to 42.00
No. 2 hvy. melting	40.00 to 40.50
RR. scrap rails	42.00 to 43.00
Rails 2 ft. and under	46.50 to 47.00
No. 1 comp'd bundles	40.00 to 40.50
Hand bdld. new shts.	40.00 to 40.50
Hvy. axle turn.	39.50 to 40.00
Hvy. steel forge turn.	39.50 to 40.00
Mach. shop turn.	32.00 to 33.00
Shoveling turn.	33.50 to 34.00
Mixed bor. and turn.	32.00 to 33.00
Cast iron borings	32.50 to 33.50
No. 1 cuppola cast	39.50 to 40.00
Hvy. breakable Cast	37.00 to 37.50
Malleable	52.00 to 53.00
RR. knuck and coup.	45.00 to 46.00
RR. coil springs	45.00 to 46.00
RR. leaf springs	45.00 to 46.00
Rolled steel wheels	45.00 to 46.00
Low phos.	42.50 to 43.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	40.00 to 40.50
No. 2 dealers' bundles	39.00 to 39.50
Bundled mach. shop turn.	39.00 to 39.50
Galv. bundles	37.00 to 37.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	37.00 to 37.50
Cast iron borings	36.00 to 36.50
Mix. borings & turn.	34.50 to 35.50
Low phos, hvy. forge	45.00 to 46.50
Low phos, plates	42.00 to 44.00
No. 1 RR. hvy. melt	41.50 to 42.50
Rerolling rails	45.00 to 46.00
Miscellaneous rails	42.50 to 43.50
Angles & splice bars	45.50 to 46.00
Locomotive tires, cut	45.00 to 46.00
Cut bolster & side frames	44.00 to 45.00
Standard stl. car axles	45.00 to 46.00
No. 3 steel wheels	44.00 to 44.50
Couplers & Knuckles	46.00 to 47.00
Malleable	58.00 to 59.00
No. 1 mach. Cast.	47.00 to 48.00
Rails 2 ft. and under	47.00 to 47.50
No. 1 agricul. cast.	42.00 to 43.00
Hvy. breakable cast.	39.00 to 41.00
RR. grate bars	41.00 to 42.00
Cast iron brake shoes	41.00 to 42.00
Cast iron carwheels	43.00 to 44.00

CINCINNATI

Per gross ton delivered to consumer:

No 1 hvy. melting	$35.50 to $36.00
No. 2 hvy. melting	35.50 to 36.00
No. 1 bundles	35.50 to 36.00
No. 2 bundles	35.50 to 36.00
Mach. shop turn.	30.50 to 31.00
Shoveling turn.	32.50 to 33.00
Cast iron borings	30.50 to 31.00
Mixed bor. & turn.	30.00 to 30.50
Low phos. plate	41.00 to 42.00
No. 1 cupola cast	46.00 to 47.00
Hvy. breakable cast.	37.00 to 38.00
Scrap rails	41.00 to 42.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	$33.50 to $34.00
No. 2 hvy. melting	33.50 to 34.00
Nos. 1 and 2 bundles	33.50 to 34.00
Busheling	33.50 to 34.00
Shoveling turn.	28.00 to 28.50
Machine shop turn.	26.00 to 26.50
Mixed bor. & turn.	26.00 to 26.50
Cl'n cast. chem. bor.	26.00 to 27.00
No. 1 machinery cast	40.00 to 45.00
No. 2 machinery cast.	40.00 to 45.00
Heavy breakable cast.	40.00 to 45.00
Stove plate	40.00 to 45.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$33.75 to $34.25
No. 2 hvy. melting	33.75 to 34.25
No. 1 bundles	33.75 to 34.25
New busheling	33.75 to 34.25
Flashings	33.75 to 34.25
Mach. shop turn.	26.50 to 27.00
Shoveling turn.	27.50 to 28.00
Cast iron borings	27.50 to 28.00
Mixed bor. & turn.	27.50 to 28.00
Low phos. plate	36.50 to 37.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	29.00 to 31.00
Stove plate	32.00 to 34.00
Automotive cast.	38.00 to 40.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy.melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
Mach. shop turn.	30.00 to 31.00
Shoveling turn.	31.00 to 32.00
Mixed bor. & turn.	28.00 to 29.00
Clean cast chemical bor.	31.00 to 33.00
No. 1 cupola Cast.	47.00 to 48.00
Hvy. breakable cast.	46.00 to 47.00
Cast. charging box	46.00 to 47.00
Clean auto cast.	47.00 to 48.00
Hvy. axle forge turn.	39.00 to 40.00
Low phos. plate	42.00 to 44.00
Low phos. punchings	42.00 to 44.00
Low phos. bundles	41.00 to 43.00
RR. steel wheels	45.00 to 46.00
RR. coil springs	45.00 to 46.00
RR. malleable	55.00 to 57.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	36.25 to 37.25
Bundled sheets	36.25 to 37.25
Mach. shop turn.	31.25 to 32.25
Locomotive tires, uncut	38.50 to 39.50
Mis. std. sec. rails	40.00 to 41.00
Rerolling rails	46.00 to 48.00
Steel angle bars	40.00 to 41.00
Rails 3 ft. and under	44.00 to 45.00
RR. steel springs	40.50 to 41.50
Steel car axles	41.50 to 42.50
Grate bars	38.00 to 39.00
Brake shoes	38.00 to 39.00
Malleable	58.00 to 59.00
Cast iron car wheels	40.00 to 41.00
No. 1 machinery cast	43.00 to 44.00
Hvy. breakable cast	38.00 to 39.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$35.50 to $36.00
No. 2 hvy. melting	35.50 to 36.00
No. 2 bundles	35.50 to 36.00
No. 1 busheling	35.50 to 36.00
Long turnings	24.00 to 24.50
Shoveling turnings	26.00 to 27.00
Cast iron borings	24.50 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cast	41.00
Stove plate	38.50 to 39.00
No. 1 RR. hvy. melt.	36.50 to 37.00
Steel axles	38.50 to 39.00
Scrap rails	38.50 to 39.00
Rerolling rails	40.50 to 41.00
Angles & splice bars	40.50 to 41.00
Rails 3 ft. & under	40.50 to 41.00
Cast iron carwheels	35.00 to 36.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
Mach. shop turn.	33.00 to 34.00
Short shov. turn.	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Low phos.	43.00 to 43.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.50 to $34.00
No. 2 hvy. melting	33.50 to 34.00
No. 2 bundles	33.50 to 34.00
Comp. galv. bundles	31.50 to 32.00
Mach. shop turn.	26.50 to 27.00
Mixed bor. & turn.	26.50 to 27.00
Shoveling turn.	28.50 to 29.00
No. 1 cuppola cast	41.00 to 41.50
Hvy. breakable cast	40.25 to 40.75
Charging box cast.	40.25 to 40.75
Stove plate	37.50 to 38.50
Clean auto cast	41.00 to 41.50
Unstrip. motor blks.	35.00 to 36.00
Cl'n chem. cast bor.	25.00 to 25.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	38.00 to 39.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	38.00 to 39.00
Mach. shop turn.	28.00 to 29.00
Shoveling turn.	30.00 to 31.00
Cast iron borings	28.00 to 29.00
Mixed bor. & turn.	28.00 to 29.00
No. 1 cupola cast.	38.00 to 40.00
Charging box cast.	33.00 to 35.00
Stove plate	35.00 to 38.00
Clean auto cast.	38.00 to 40.00
Malleable	39.00 to 41.00
Low phos. plate	38.00 to 40.00
Scrap rails	37.00 to 38.00
Rails 3 ft. & under	40.00 to 42.00
RR. steel wheels	40.00 to 42.00
Cast iron carwheels	40.00 to 42.00
RR. coil & leaf spgs.	40.00 to 42.00
RR. knuckles & coup	40.00 to 42.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.00 to $38.50
No. 2 hvy. melting	38.00 to 38.50
Compressed sheet stl.	38.00 to 38.50
Drop forge flashings	38.00 to 38.50
No. 2 bundles	38.00 to 38.50
Mach. shop turn.	32.00 to 33.00
Shoveling turn.	33.00 to 34.00
No. 1 busheling	38.00 to 38.50
Steel axle turn.	38.00 to 38.50
Cast iron borings	33.00 to 34.00
Mixed bor. & turn.	32.00 to 32.50
Low phos.	41.00 to 42.00
No. 1 machinery cast.	47.00 to 47.50
Malleable	54.00 to 55.00
RR. Cast.	47.00 to 47.50
Railroad grate bars	42.00 to 44.00
Stove plate	42.00 to 44.00
RR. hvy. melting	38.00 to 39.00
Rails 3 ft. & under	47.00 to 48.00
Rails 18 in. & under	48.00 to 49.00

SAN FRANCISCO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50
No. 2 hvy. melting	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	13.00
Elec. furn. 1 ft. und.	25.00
No. 1 cupola cast.	$32.00 to 33.00
RR. hvy. melting	20.50

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	$19.50
No. 2 hvy. melting	19.50
No. 1 bales	19.50
No. 2 bales	19.50
No. 3 bales	16.00
Mach. shop turn.	14.50
No. 1 cupola cast.	$32.00 to 33.00
RR. hvy. melting	20.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$20.00
Elec. furn. 1 ft. und.	$23.50 to 25.00
No. 1 cupola cast.	27.50 to 29.00
RR. hvy. melting	21.00

HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point

Heavy melting	$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

* Ceiling price.

Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	July 22, 1947	July 15, 1947	June 24, 1947	July 23, 1946
Hot-rolled sheets	2.50	2.50	2.50	2.425
Cold-rolled sheets	3.20	3.20	3.20	3.275
Galvanized sheets (10 ga.)	3.55	3.55	3.55	4.05*
Hot-rolled strip	2.50	2.50	2.50	2.35
Cold-rolled strip	3.20	3.20	3.20	3.05
Plates	2.65	2.65	2.65	2.50
Plates, wrought iron	5.95	5.95	5.95	4.112
Stain's c-r strip (No. 302) *24 ga	30.30	30.30	30.30	30.30
Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes.	$5.75	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30
Bars and Shapes: (cents per pound)				
Merchant bars	2.60	2.60	2.60	2.50
Cold-finished bars	3.20	3.20	3.20	3.10
Alloy bars	3.05	3.05	3.05	2.92
Structural shapes	2.50	2.50	2.50	2.35
Stainless bars (No. 302).	26.00	26.00	26.00	25.97
Wrought iron bars	6.15	6.15	6.15	4.76
Wire and Wire Products: (cents per pound)				
Bright wire	3.30	3.30	3.30	3.05
Wire nails	3.75	3.75	3.75	3.75
Rails: (dollars per 100 lb)				
Heavy rails	$2.50	$2.50	$2.50	$43.39*
Light rails	2.85	2.85	2.85	49.18*
*per net ton				
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$42.00	$42.00	$42.00	$39.00
Sheet bars	53.00	53.00	53.00	38.00
Slabs, rerolling	42.00	42.00	42.00	39.00
Forging billets	50.00	50.00	50.00	47.00
Alloy blooms, billets, slabs	61.00	61.00	61.00	58.43
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.55	2.55	2.55	2.30
Skelp	2.35	2.35	2.35	2.05

Pig Iron: (per gross ton)	July 22, 1947	July 15, 1947	June 24, 1947	July 23, 1946
No. 2, foundry, Phila.	$39.22	$38.22*	$36.51	$28.34
No. 2, Valley furnace	36.50	33.50	33.50	26.50
No. 2, Southern, Cin'ti	38.25	34.75	34.75	28.94
No. 2, Birmingham	33.38	29.88	29.88	24.88
No. 2, foundry, Chicago†	36.00	33.00	33.00	26.50
Basic, del'd Philadelphia	39.89	38.89*	36.92	27.84
Basic, Valley furnace	36.00	33.00	33.00	26.00
Malleable, Chicago†	36.50	33.50	33.50	26.50
Malleable, Valley	36.50	33.50	33.50	26.50
Charcoal, Chicago	48.49	48.49	48.49	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
* Revised due to current market conditions.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$40.25	$38.75	$35.75	$20.00
Heavy melt'g steel, Phila.	39.50	37.75	37.25	18.75
Heavy melt'g steel, Ch'go	40.25	36.75	31.25	18.75
No. 1, hy. comp. sheet, Det.	34.00	34.00	30.00	17.32
Low phos. Youngs'n	43.25	43.25	38.75	22.50
No. 1, cast, Pittsburgh	39.75	38.25	36.50	20.00
No. 1, cast, Philadelphia	47.50	47.50	46.50	28.50
No. 1, cast, Chicago	47.50	45.50	43.00	20.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.00	$12.00	$10.50	$8.75
Foundry coke, prompt	13.75	13.75	11.25	9.85
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	14.375
Copper, Lake, Conn.	21.625	21.625	21.625	14.375
Tin, Straits, New York	80.00	80.00	80.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	9.50
Lead, St. Louis	14.80	14.80	14.80	9.50
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	14.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when the actual data of shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
July 22, 1947	2.85664¢ per lb.	$36.18 per gross ton	$40.00 per gross ton
One week ago	2.85664¢ per lb.	$33.43* per gross ton	$37.75 per gross ton
One month ago	2.85664¢ per lb.	$33.15 per gross ton	$34.75 per gross ton
One year ago	2.73011¢ per lb.	$26.45 per gross ton	$19.17 per gross ton

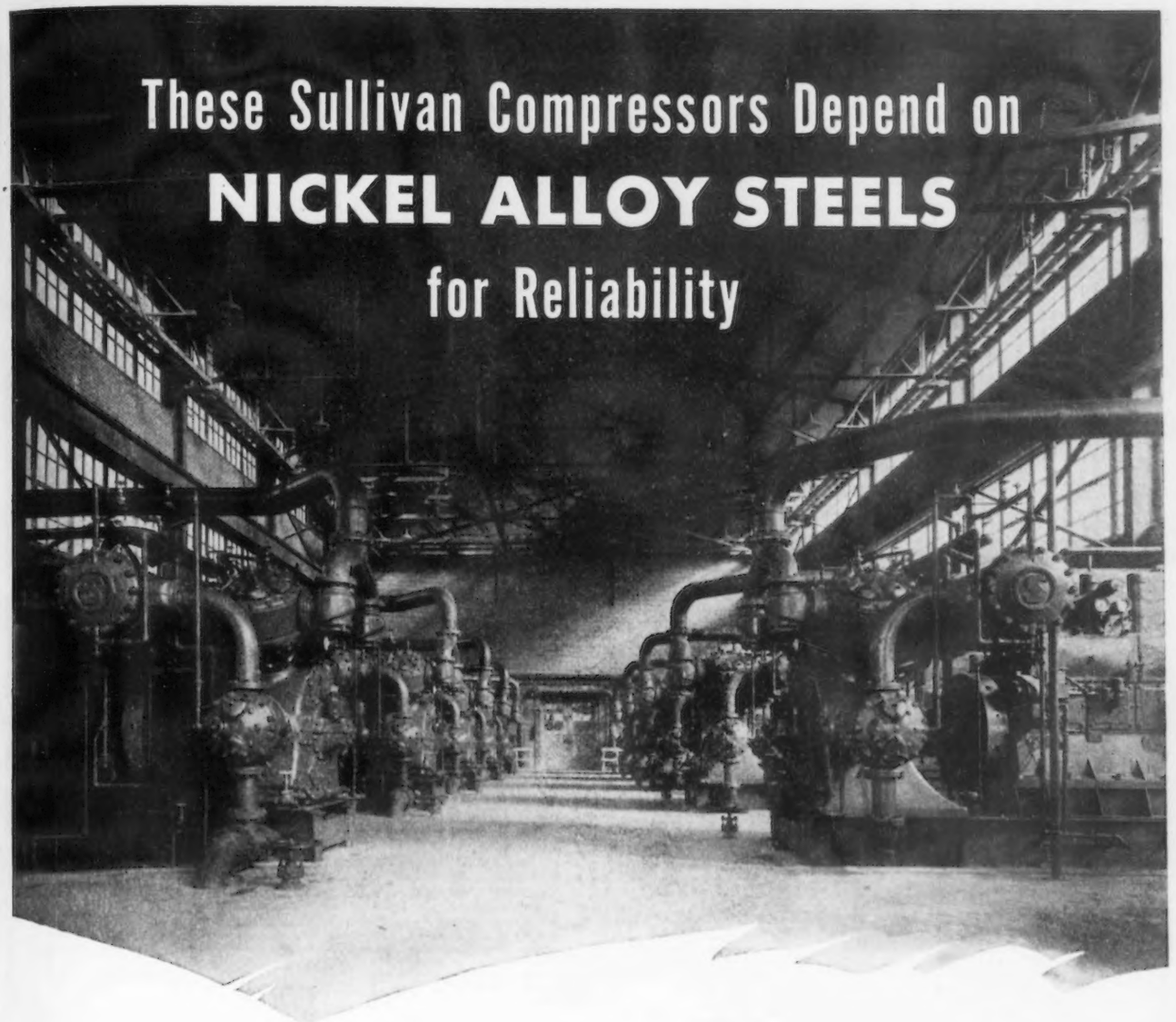
	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1947	2.85664¢	2.85664¢	$36.18 July 22	$30.14 Jan. 7	$40.00 July 22	$29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 66 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.
* Revised due to current market conditions.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

These Sullivan Compressors Depend on NICKEL ALLOY STEELS for Reliability



These compressors, built by the Sullivan Division of Joy Manufacturing Company, are a good example of the way Nickel alloy steels help make equipment longer-lasting and more dependable.

Crankshafts in these units are of large diameter, and accordingly, a Nickel-chromium-molybdenum steel, Type 4340, is used to secure good depth hardening. This steel makes possible heat treated forgings that provide ample strength, good ductility and ready machinability.

Cross head pins and other stressed parts are produced in a case hardening Nickel-molybdenum steel, Type 4615. This steel responds readily with minimum distortion to simple quenching treatments, and affords a wear resistant, non-spalling surface supported by a tough core that enables the part to resist shocks and overloads.

The excellent mechanical and fabricating properties of Nickel alloy steels provide a practical answer to problems of low-cost, trouble-free operation of equipment.

EMBLEM OF INCO SERVICE

TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the selection, fabrication, treatment and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes and other alloys containing Nickel. This information and data are yours for the asking. Write for "List A" of publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound of dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Spot market as high as $92 gross ton. (17) Delivered Los Angeles: add ½¢ per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases.

Basing Point:	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS															
Carbon, rerolling	($35.00 f. o. b. mill) (Spot market as high as $80 gross ton)														
Carbon, forging	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00								
Alloy	$52.00						(Canton = $52.00)								
BILLETS, BLOOMS, SLABS							(Provo = $53.20)								
Carbon, rerolling [18]	$42.00	$42.00	$42.00	$42.00	$42.00	$42.00	$42.00	$42.00					$45.00		
Carbon, forging billets	$50.00	$50.00	$50.00	$50.00	$50.00	(Provo = $61.20, Duluth = $52.00[13]) $50.00	$50.00						$53.00		
Alloy	$61.00	$61.00				$61.00	(Bethlehem, Massillon, Canton = $61.00)						$64.00		
SHEET BARS[16]							$53.00								
PIPE SKELP	2.35¢	2.35¢					2.35¢	2.35¢	(Coatesville = 2.35¢)						
WIRE RODS	2.55¢	2.55¢		2.55¢	2.55¢	(Worcester = 2.65¢)						3.27¢[13]			
SHEETS															
Hot-rolled	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.875¢	2.50¢		3.24¢[17]	2.65¢	2.79¢	2.70¢
Cold-rolled[1]	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢	3.20¢		3.30¢				3.35¢	3.61¢	3.58¢
Galvanized (10 gage)	3.55¢	3.55¢	3.55¢		3.55¢		3.55¢	3.55¢	3.65¢			4.32¢[17]		3.84¢	3.75¢
Enameling (12 gage)	3.55¢	3.55¢	3.55¢	3.55¢			3.55¢		3.65¢				3.70¢	3.95¢	3.93¢
Long ternes [2] (10 gage)	3.55¢	3.55¢	3.55¢											3.95¢	3.91¢
STRIP															
Hot-rolled[3]	2.50¢	2.50¢	2.50¢	2.50¢[15]	2.50¢		2.50¢						2.65¢	2.93¢	2.88¢
Cold-rolled[4]	3.20¢	3.30¢		3.20¢			3.20¢			(Worcester = 3.40¢)			3.35¢	3.61¢	3.58¢
Coeperage stock	2.80¢	2.80¢			2.80¢		2.80¢							3.09¢	
TINPLATE															
Standard cokes, base box	$5.75	$5.75	$5.75		$5.85			$5.85	$5.85		(Warren, Ohio = $5.75)			$6.157	$6.062[11]
Electro, box (0.25 lb.)	Deduct 90¢ from standard coke base box price.														
Electro, box (0.50 lb.)	Deduct 70¢ from standard coke base box price.														
Electro, box (0.75 lb.)	Deduct 50¢ from standard coke base box price.														
BLACKPLATE, 29 gage[5]	3.60¢	3.60¢	3.60¢		3.70¢			3.70¢	3.70¢		(Warren, Ohio = $5.75)			3.99¢	3.90¢
BLACKPLATE, CANMAKING															
55 lb. to 70 lb.	Deduct $1.55 from standard coke base box.														
75 lb. to 95 lb.	Deduct $1.65 from standard coke base box.														
100 lb. to 118 lb.	Deduct $1.55 from standard coke base box.														
TERNES, MFG., Special coated	Deduct 85¢ from standard coke base box price.														
BARS															
Carbon steel	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢	2.60¢					3.285¢	2.75¢	3.01¢	2.98¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢	2.45¢				2.985¢		2.74¢	2.65¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.20¢	3.20¢	3.20¢	3.20¢		3.20¢							3.35¢	3.61¢	3.58¢
Alloy, hot-rolled	3.05¢	3.05¢				3.05¢	3.05¢	(Bethlehem, Massillon, Canton = 3.05¢)					3.20¢		3.19¢
Alloy, cold-drawn	3.80¢	3.80¢	3.80¢	3.80¢		3.80¢							3.95¢		
PLATE								(Coatesville = 2.80¢, Claymont = 2.90¢, Geneva, Utah = 2.80¢)							
Carbon steel[12]	2.65¢	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢	2.65¢				3.46¢[14]		2.87¢	2.85¢
Floor plates	3.90¢	3.90¢												4.30¢	4.28¢
Alloy	3.79¢	3.79¢			(Coatesville = 4.10¢)									4.01¢	3.895¢
SHAPES, Structural	2.50¢	2.50¢	2.50¢		2.50¢	2.50¢	(Geneva, Utah = 2.65¢) (Bethlehem = 2.50¢)					3.17¢[10]		2.70¢	2.64¢
SPRING STEEL, C-R															
0.26 to 0.40 carbon	3.20¢			3.20¢			(Worcester = 3.40¢)								
0.41 to 0.60 carbon	4.70¢			4.70¢			(Worcester = 4.90¢)								
0.61 to 0.80 carbon	5.30¢			5.30¢			(Worcester = 5.50¢)								
0.81 to 1.00 carbon	6.80¢			6.80¢			(Worcester = 7.00¢)								
Over 1.00 carbon	9.10¢			9.10¢			(Worcester = 9.30¢)								
MANUFACTURERS' WIRE[9]															
Bright	3.30¢	3.30¢		3.30¢	3.30¢		(Worcester = 3.40¢, Duluth = 3.35¢)					4.31¢[13]		3.71¢	3.68¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.25¢	4.25¢		4.25¢	(Worcester = 4.35¢, Duluth = 4.50¢) (Trenton = 4.50¢)							5.28¢[13]		4.68¢	4.595¢
PILING, Steel sheet	3.00¢	3.00¢				3.00¢								3.41¢	3.38¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton (4 to 6 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo		Base per lb
18	4	1	—	.....	74¢
1.5	4	1.5	8	.....	59¢
6	4	2	6	.....	63¢
High-carbon-chromium*				.....	47¢
Oil hardening manganese*				.....	26¢
Special carbon*				.....	24¢
Extra carbon*				.....	20¢
Regular carbon*				.....	16¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.20¢
Armature	4.50¢
Electrical	5.00¢
Motor	5.75¢
Dynamo	6.45¢
Transformer 72	6.95¢
Transformer 65	7.65¢
Transformer 58	8.35¢
Transformer 52	9.15¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., per 100 lb	$2.50
Angle splice bars, 100 lb	3.00
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$2.85
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45

	Base per lb
Cut spikes	4.50¢
Screw spikes	6.40¢
Tie plate, steel	2.80¢
Tie plates, Pacific Coast	2.95¢
Track bolts	6.50¢
Track bolts, heat treated, to rail roads	6.75¢
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Weirton, W. Va.; St. Louis, Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C	$6.75	$13.50

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	Delivered San Francisco
Standard, galvanized and coated nails	$3.75†	$4.83
Cut nails, carloads, Pittsburgh base	5.30	....

†10¢ additional at Cleveland, 30¢ at Worcester.

	Base per 100 lb	
Annealed fence wire	$3.95‡	$4.96
Annealed galv. fence wire	4.40‡	5.41

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base	column
Woven wire fence*	84	107
Fence posts, carloads	90††	...
Single loop bale ties	86	110
Galvanized barbed wire**	94	114
Twisted barbless wire	90	...

* 15½ gage and heavier. ** On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	* Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10	4.10
Sheets									
Hot-rolled	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
Cold-rolled	4.75	4.75	4.75	....	4.75	4.75	4.75	4.75	4.75
Galvanized	....	5.40	....	....	....	5.40	....	....	....
Strip									
Hot-rolled	3.85	3.85	3.85	....	3.85	3.85	3.85	3.85	3.85
Cold-rolled	....	....	4.75	....	....	4.75	4.75	4.75	4.75†
Shapes	....	3.85	....	....	3.85	3.85	3.85	3.85	....
Beams	....	3.85	....	....	....	3.85	....	....	....
Bars									
Hot-rolled	4.00	4.00	4.00	....	....	4.00	4.00	4.00	4.00
Cold-rolled	....	....	....	....	....	....	....	4.60	....
Bar shapes	....	4.00	....	....	4.00	4.00	4.00	4.00	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts. F.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only

Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
½-in.	55½	41
¾-in.	58½	45
1 to 3-in.	60½	47½
Wrought Iron, buttweld		
½ in.	2	+30
¾-in.	11½	+10
1 and 1¼-in	17	+ 2
1½-in.	22½	1½
2-in.	23	2
Steel, lapweld		
2-in.	53	39½
2½ and 3-in.	56	42½
3½ to 6-in.	58	44½
Steel, seamless		
2-in.	52	38½
2½ and 3-in.	55	41½
3½ to 6-in.	57	43½
Wrought Iron, lapweld		
2-in.	14½	+ 5½
2½ to 3½-in.	17	+ 1½
4-in.	21	4
4½ to 8-in.	19	2½

Extra Strong, plain ends

Steel, buttweld		
½-in.	54½	41½
¾-in.	58½	45½
1 to 3-in.	60	48
Wrought iron, buttweld		
½-in.	6½	+14
¾-in.	12½	+ 8
1 to 2-in.	22	2
Steel, lapweld		
2-in.	52	39½
2½ and 3-in.	56	43½
3½ to 6-in.	59½	47
Steel, seamless		
2-in.	51	38½
2½ and 3-in.	55	42½
3½ to 6-in.	58½	46
Wrought Iron, lapweld		
2-in.	17½	+ 2
2½ to 4-in.	26	8½
4½ to 6-in.	22	4

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to24 ft, inclusive.

OD in.	Gage BWG	Seamless Hot-Rolled	Seamless Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$15.29	$18.17	$15.00	$17.95
2½	12	20.57	24.43	20.11	24.07
3	12	22.87	27.18	22.26	26.68
3½	11	28.86	34.30	28.06	33.64
4	10	35.82	42.55	34.78	41.68

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	$81.56
6-in. to 24-in. del'd New York	79.80
6-in. to 24-in., Birmingham	71.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	95.00

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
½ in. & smaller x 6 in. & shorter	48
9/16 & ⅝ in. x 6 in. & shorter	50
All larger diam and longer lengths	47
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Plow bolts	57

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	48
9/16 to 1 in. inclusive	47
1⅛ to 1½ in. inclusive	45
1⅝ in. and larger	40

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts

Base discount less case lots

	USS	SAE
7/16 in. and smaller		51
½ in. and smaller	50	..
½ in. through 1 in.		48
9/16 in. through 1 in.	49	..
1⅛ in. through 1½ in.	47	46
1⅝ in. and larger	40	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

	Consumer
Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets (½ in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.25
F.o.b. Lebanon, Pa.	5.40

Small Rivets (7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55 and 5

Cap and Set Screws

(In packages)	*Consumer*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	56
¾ to 1 in. x 6 in., SAE 1035, heat treated	47
Set screws, cup and oval points	61
Milled studs	33
Flat head cap screws, listed sizes	21
Fillister head cap, listed sizes	40

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports*)

	Per Gross Ton
Old range, bessemer	$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31½¢
Copper, reduced, 150 and 200 mesh	29¢ to 30½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 15¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	29¢ to 31¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to $1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 36¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	$2.00
Chromium, 100 mesh and finer	$1.025
Lead, 100, 200, & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 150 mesh	51½¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh	8½¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb	$2.90
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	$2.65
Under 100 lb	$2.90

COKE

Furnace, beehive (f.o.b. oven) Connellsville, Pa.	Net Ton $11.50 to $12.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	13.00 to 14.50
Foundry, Byproduct	
Chicago, del'd	$17.10
Chicago, f.o.b.	16.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	15.35
Philadelphia, f.o.b.	15.50
Swedeland, Pa., f.o.b.	15.50
Buffalo, del'd	17.25
Ashland, Ohio, f.o.b.	14.50
Painesville, Ohio, f.o.b.	14.60
Erie, del'd	16.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	15.85
Birmingham, del'd	15.00

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads, Per 1000
First quality, Ohio	$64.00
First quality, Pa., Md., Ky., Mo.	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo.	64.00
Sec. quality, New Jersey	59.00
Sec. quality, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

Silica Brick

Pennsylvania and Birmingham	$70.00
Chicago District	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$59.00

Magnesite Brick

Standard, Balt. and Chester	$81.00
Chemically bonded, Baltimore	70.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk	$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, Ohio	10.55

Midwest, add 10¢; Mo. Valley, add 20¢

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP				BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled	Plates	Standard Structural Shapes	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.14	$5.18	$5.29	$4.43	$5.28	$4.44	$4.22	$4.48	$5.13	$8.37	$8.37	$9.88	$9.88
New York	4.22	5.17[1]	5.47	4.62	5.40	4.72	4.42	4.62	5.17	8.42	8.42	9.92	9.92
Boston	4.40	5.22	4.95[12]	4.65	6.36	4.70	4.47	4.62	5.22	8.62	8.62	9.97	9.97
Baltimore	3.89	....	5.14	4.40	....	4.39	4.34	4.45	5.10	....	....	....	....
Norfolk	4.15	....	....	....	....	4.50	4.50	4.75	5.50	....	....	....	....
Chicago	3.65	....	....	4.05	5.05	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Milwaukee	4.099	4.899[1]	5.249	4.199	....	4.399	4.249	4.249	4.899	8.399	8.399	9.649	9.649
Cleveland	3.95	4.55	5.238	4.188	5.00	4.25†	4.311	4.10	4.75	8.358	8.358	9.35	9.35
Buffalo	4.15	4.85[1]	5.35	4.30	5.25	4.55	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Detroit	4.05	4.85	5.42	4.34	5.24	4.49†	4.42	4.20	4.87	8.51	8.51	9.74	9.74
Cincinnati	3.916	4.716	5.166	....	....	4.553	4.444	4.403	5.053	....	....	....	....
St. Louis	3.999	4.799[1]	5.424	4.199	5.424	4.399	4.249	4.249	5.074	8.574	8.574	9.824	9.824
Pittsburgh	3.95	4.65[1]	5.10	4.05	4.95	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
St. Paul	4.284[7]	5.084[1]	5.434[2]	4.384[7]	....	4.584[7]	4.434[7]	4.434[7]	5.476[6]	....	7.084[6]	....	....
Omaha	4.768	6.118[1]	5.918	4.868	....	5.068	4.918	4.918	5.568	....	....	....	....
Indianapolis	3.84	4.84	5.29	4.24	5.01	4.51	4.36	4.56	5.01	....	....	....	....
Birmingham	4.15[11]	....	5.25	4.15[11]	....	4.35[11]	4.10[11]	4.10[11]	5.58	....	....	....	....
Memphis	4.32[11]	5.53[11]	5.97	4.72[11]	....	4.92[11]	4.67[11]	4.67[11]	5.78	....	....	....	....
New Orleans	*4.68[11]	5.94[1]	....	4.88[11]	....	5.03[11]	*4.73[11]	*4.83[11]	5.94[6]	....	....	....	....
Los Angeles	5.15	7.00[1]	6.70	5.65	8.35[5]	5.10	5.20	5.10	6.90[14]	10.15	9.35	11.05	11.05
San Francisco	4.70[8]	6.30[9]	6.45	5.20[8]	....	5.00[8]	4.90[8]	4.75[8]	7.00[10]	....	....	....	....
Seattle	4.80[4]	6.75[2]	6.30	5.30[4]	....	5.15[4]	4.95[4]	5.00[4]	7.10[14]	....	9.50[6]	....	10.85[6]
Portland	5.00[4]	....	6.25	5.50[4]	....	5.25[4]	5.10[4]	5.10[4]	7.20	....	9.30[6]	....	....
Salt Lake City	5.65	....	7.10	6.35	....	5.70	5.85	5.95	7.00	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 lb and over.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 3749; (13) 400 to 1999; (14) 1500 and over.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37.50	38.00	38.50	.....	Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Birdsboro	40.00	40.50	41.00	41.50	45.00	Boston	Steelton	4.82	.....	.....	.....	.....	46.82
Birmingham	32.88	33.38	....	....	.....	Brooklyn	Bethlehem	3.00	40.00	40.50	41.00	41.50	.....
Buffalo	35.50	36.00[4]	36.50	.....	.....	Brooklyn	Birdsboro	3.50	.....	.....	.....	.....	48.50
Chicago	35.50	36.00	36.50	37.00	.....	Cincinnati	Birmingham	4.87	37.75	38.25	.....	.....	.....
Cleveland	35.50	36.00	36.50	.....	.....	Jersey City	Bethlehem	1.84	38.84	39.34	39.84	40.34	.....
Duluth	36.00	36.50	37.00	37.50	.....	Jersey City	Birdsboro	2.33	.....	.....	.....	.....	47.33
Erie	35.50	36.00	36.50	37.00	.....	Los Angeles	Provo	5.94	39.94	40.44	.....	.....	.....
Everett	.....	45.00	45.50	.....	.....	Mansfield	Cleveland-Toledo	2.33	37.83	38.33	38.83	39.33	.....
Granite City	35.50	36.00	36.50	.....	.....	Philadelphia	Bethlehem	1.67	38.67	39.17	39.67	37.17	.....
Neville Island	36.00	36.50	36.50	37.00	.....	Philadelphia	Swedeland	1.01	39.51	36.51	37.01	37.51	.....
Provo	34.00	34.50	.....	.....	.....	Philadelphia	Steelton	2.15	39.15	.....	.....	.....	44.15
Sharpsville	36.00	36.50	36.50	37.00	.....	San Francisco	Provo	5.94	39.94	40.44	.....	.....	.....
Steelton	37.00	.....	.....	.....	42.00	Seattle	Provo	5.94	39.94	40.44	.....	.....	.....
Struthers, Ohio	36.50	.....	.....	.....	.....	St. Louis	Granite City	0.75 Arb.	36.25	37.25	37.25	.....	.....
Swedeland	38.50	35.50	36.00	36.50	.....								
Toledo	35.50	36.00	36.50	37.00	.....								
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00								
Youngstown	36.00	36.50	36.50	37.00	.....								

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$42.50; f.o.b. Buffalo—$43.75. Add $1.00 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous $43.00 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, $48.49. High phosphorous charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Less ton lots (packed)	157.00
Delivered Pittsburgh	140.25

$1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	7.00	7.25	7.80
Ton lots	8.00	8.60	10.50
Less ton lots	8.40	9.00	10.90

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$43.00	$44.00
F.o.b. Pittsburgh	47.00	48.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	30
L.c.l. lots	32

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.06% max. C, 0.06% P, 90% Mn	21.00	22.10	22.70
0.10% max. C	20.50	21.60	22.20
0.15% max. C	20.00	21.10	21.70
0.30% max. C	19.50	20.60	21.20
0.50% max. C	19.00	20.10	20.70
0.75% max. C, 7.00% max. Si	16.00	17.10	17.70

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.65
Ton lots	7.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	6.75
Ton lots	7.75
Less ton lots	8.15

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $64.00 f.o.b. Keokuk, Iowa; $65.00 f.o.b. Niagara Falls. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	16.50	17.85	19.60
97% Si, 1% Fe	16.00	18.25	20.00

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si. 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	4.25	4.50	4.70
Ton lots	5.25	5.85	6.15
Less ton lots	5.65	6.25	6.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.00	15.65	15.90
50% Si	7.80	8.30	8.50
75% Si	10.00	10.30	11.05
80-90% Si	11.30	11.60	12.35
90-95% Si	12.80	13.10	13.80

Ferrochrome (65-72% *Cr, 2% max. Si*)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	23.00	23.40	24.00
0.10% C	22.50	22.90	23.50
0.15% C	22.00	22.40	23.00
0.20% C	21.75	22.15	22.25
0.50% C	21.50	21.90	22.00
1.00% C	21.00	21.40	21.50
2.00% C	20.50	20.90	21.00
65-69% Cr, 4-9% C	15.60	16.00	16.15
62-66% Cr. 4-6% C. 6-9% Si.	16.60	17.00	17.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	9.85	10.10	10.20
Ton lots	10.75	11.65	12.25
Less ton lots	11.15	12.05	12.65

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chrominum contained, lump sie, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	16.70	17.10	17.25
Ton lots	17.90	19.20	20.00
Less ton lots	18.60	19.90	20.70

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	21.00	21.40	21.50
Ton lots	22.35	23.00	24.20
Less ton lots	23.35	24.00	25.20

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C.	83.50	85.00	86.25
0.50% max. C.	79.50	81.00	82.25
9.00% min. C.	79.50	81.00	82.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	14.00	14.50	16.55
Ton lots	16.10	16.85	19.00
Less ton lots	17.10	17.85	20.00

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	17.60	18.45	20.20
Less ton lots	18.60	19.45	21.20

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots	$1.60	$2.35 $2.95
Less ton lots	1.95	2.70 3.75

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr. 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	16.00	17.10	19.05
Less ton lots	16.75	17.85	19.80

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	14.25	15.35	17.30
Less ton lots	15.00	16.10	18.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.25
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.70
Crucible	$2.80
High speed steel (Primos)	$2.90
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2O_5	$1.10
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b Langeloth, Washington, Pa., Per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$142.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton	$65.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	17.00¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	5.50¢
Alsifer, 20% Al, 40% Si, 40% Ft, contract basis, f.o.b. Niagara Falls, carload	6.25¢
Ton lots	6.75¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17-50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$2.10	$2.1125 $2.1445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	35¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1	87.5¢
No. 6	60¢
No. 79	45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15—17%, B 0.90—1.15%, Si 2.5—3.0% Al 1.0—2.0%.

Ton lots, per pound	8.0¢

Kaiser Blast Furnace Completes Successful Eagle Mountain Ore Run

Fontana, Calif.

• • • **The Kaiser Steel** blast furnace at Fontana, Calif, has just successfully completed the first run on Eagle Mountain ore. These test results are reported to have exceeded the best hopes of the operators.

A small percentage of the ore was first put on the furnace on June 10 and the proportion was steadily increased until June 16, when 80 pct of the burden was composed of Eagle Mountain ore, either as the raw ore or as sinter produced from the ore. This percentage was maintained until the completion of the test run on June 27, except for a 2-day period when 100 pct Eagle Mountain was charged. The total quantity of ore used amounts to 30,000 net tons.

Following are the significant figures for the test run:

	June 16 to June 27	Entire Run June 10 to June 27
Eagle Mountain Ore in burden —pct	84.9	78.4
Scrap charged—lb per net ton	0	0
Ave. daily production—net tons	1,243	1,233
Ave. coke consumption—lb per net ton	1,437	1,451
Ave. flue dust production—lb per net ton	27	31
Ave. wind blown—cfm	60,000	60,000
Ave. coke ash—pct	10.1	10.1
Ave. coke sulphur—pct	0.98	0.99
Ave. blast temperature—Deg. F.	1,163	1,173
Ave. blast pressure—psi	16.7	16.2

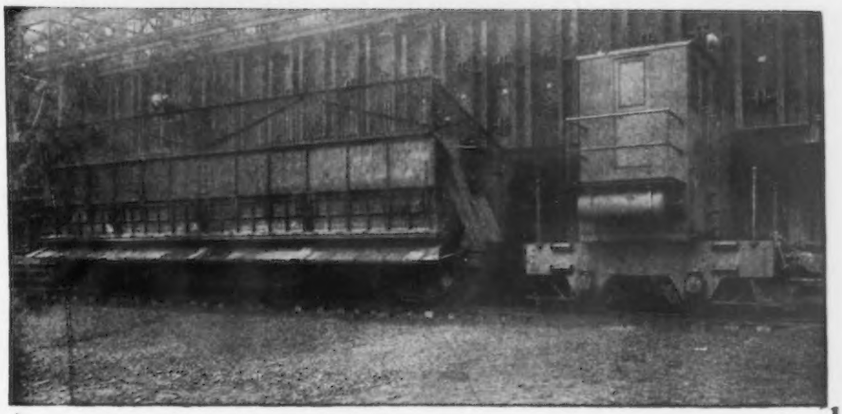
There were no changes made to the furnace, other than the change to Eagle Mountain ore. The furnace has a 25 ft 6 in hearth diameter and was blown in on Jan. 1, 1943.

The Eagle Mountain ore mined for the test has analyzed as follows:

Constituent	Natural Analysis Per Cent
Fe	53.91
Phos	0.031
Mn	0.05
SiO_2	8.21
Al_2O_3	2.45
CAO	1.69
Mgo	3.15
S	0.293

The company believes that Eagle Mountain ore can be mined and delivered at Fontana at an Fe unit cost that is less than the corresponding cost for any other ore delivered at any other plant in the country. The company officials believe that this ore will be available for steady use in quantity sometime next

COKE OVEN EQUIPMENT



QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

Other ATLAS Products

Ore Transfer Cars
•
Scale Charging Cars
•
Electrically Operated Cars for Every Haulage Purpose

Locomotives for Switching and Interplant Haulage
•
Turntables

The ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1100 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

"Zincilate*"

Cuts Corrosion Costs!

"Beats the Devil Out of Corrosion"

20 YEARS LIFE

Estimated Usage, Based on 1000 Hours ASTM Salt Spray Treatment

● ZINCILATE, THE ONE-COAT SELF-PROTECTING ANTI-CORROSIVE COATING, can be applied on ferrous metals and aluminum . . . sheet, strip, wire, forgings and castings. ZINCILATE can be sprayed, dipped or brushed. No special equipment is required. It can be baked either in convection or infrared oven or by hot air blast, or by open oxyacetylene flame. Accelerated tests to A.S.T.M. specifications show no corrosion of ZINCILATE after one thousand hours' exposure to salt corrosion treatments.

ZINCILATE IS NOT A COMMON, TYPICAL ZINC BASE PAINT

ZINCILATE is a revolutionary inorganic coating containing no resins, oils or solvents. It is based on chemical and physical principles never before employed in anti-corrosive coating materials. ZINCILATE is applied to a thickness of only two or three mils. Protection with ZINCILATE does not depend on the self-sacrificial action of zinc, therefore, does not depend on a heavy coating. ZINCILATE weighs one ounce per square foot at two mils thickness and covers four hundred square feet per gallon.

Zincilate is a low cost coating. It is a one-coat application, saving labor and material. It requires no primer. It has great covering power due to its uniform thickness in a coating film of two to three mils. It lasts many times as long as ordinary protective coatings, eliminating replacement and repair.

USES for "ZINCILATE"

Iron and Steel Manufacture

Shipbuilding

Railroads

Construction

Utilities

Manufactured Products

Characteristics and Technical Data: Color: gray. Finish: dull matte or bright polished. Viscosity: 20 seconds ± 4, #4 Ford cup initial; after five days, 35 seconds. Weight, gallon, 26.70 ± .5. Hardness: Rockwell at 5P measures 40B. Abrasion: excellent — 68,000 cycles Taber F10-1000 gm. load. Adhesion: excellent. Coverage: 400 square feet per gallon (approx.). Corrosion Resistance: salt spray treatment for 1,000 hours, no failure (estimated equivalent, 20 years in use). Weatherometer—3,600 hours, no failure. Film Properties: withstands air temperatures to 700°F, transient heat to 6300°F.

*Trade Mark

INDUSTRIAL METAL PROTECTIVES, INC.

137 NORTH PERRY ST. **DAYTON 2, OHIO**

***PRICES:** $8.00 per gallon in drums • $10.00 per gallon in one-gallon cans • $9.50 in 5-gal. cans • Tank Car lots of 10,000 gal. $7.20 per gal. F.O.B. Newport News, Va.*

BUY "ZINCILATE" FOR YOUR anti-corrosion applications, *today!*

Use this convenient order form . . . we'll bill you upon shipment.

Ship_____gallons "Zincilate" @_____per gallon to:

Company_____

Address_____

City_____ **Zone**_____ **State**_____

Signed:_____ **Title**_____

spring. The amount of known ore in the deposit is 25 million net tons, which should last for 40 years at the present rate of consumption. It is believed, however, that the amount of ore actually present in the area will exceed 70 years' supply.

Ferroalloys May Be Available for Export From France In 1947

Paris

• • • **Consumption** of ferroalloys in France has increased to the point where the annual prewar capacity of 47,000 metric tons is insufficient for domestic needs. Production was expanded to 52,000 tons last year, and 1947 output is expected to reach 68,000 tons, which may permit small exports. Ferrochrome and ferrotungsten are both expected to be available for shipments late this year.

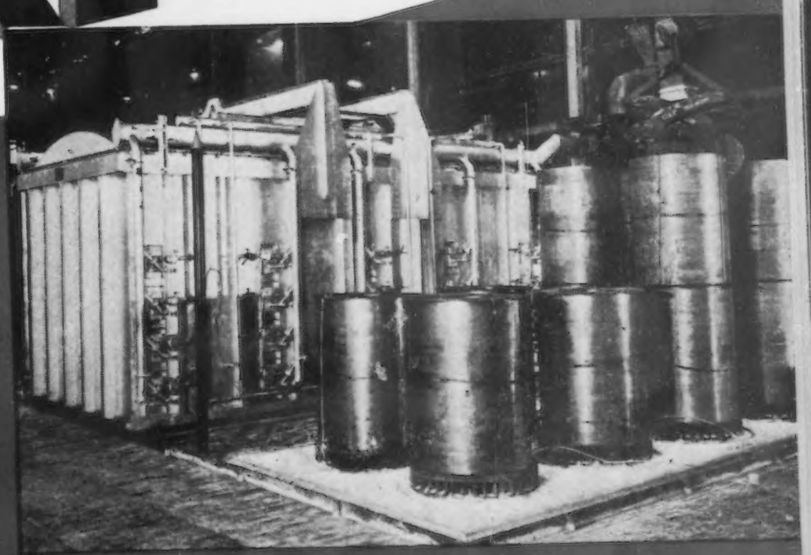
Production of nickel in France during 1946 from New Caledonian ores amounted to 873 tons. Production of ores in New Caledonia is hampered by the lack of coal and manpower. This factor is holding down French nickel at the refinery at Le Havre to below the 1938 figure of 3500 tons.

French imports of nickel last year were 2800 tons, but there is some difficulty in arranging shipments at present. French sources state that estimated production at Le Havre this year will be 2500 tons.

French cobalt requirements have increased from 13 tons in 1938 to 170 tons last year. French production from Moroccan ores amounted to about 50 tons, and ores being treated in Belgium for French account produced about 120 tons. It is hoped that French production will be up to 400 tons this year. Cobalt resources in Morocco are large enough to cover all future needs.

Antimony was produced at a rate of 700 tons a year in France during 1946, and imports supplied 770 tons during the year. The total consumption of 1470 tons compares with 1550 tons used during 1938. Cadmium recovered from zinc ores treated in France amounted to 47 tons last year, and 141 tons were imported.

SWINDELL • DRESSLER



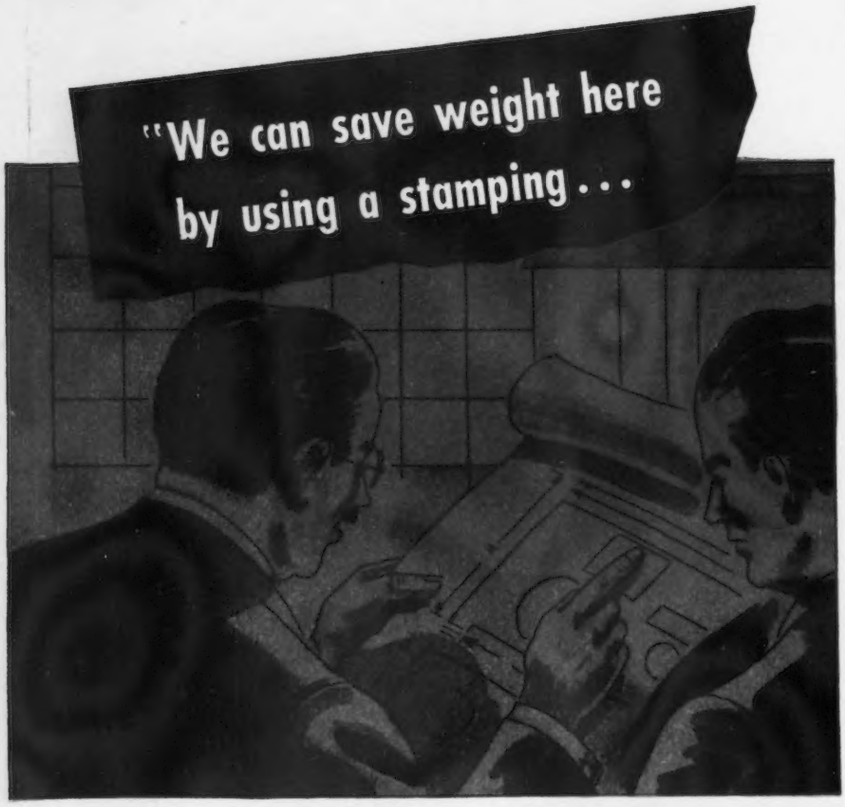
a recent high-capacity furnace installation for a large strip mill.

MAY WE HAVE YOUR INQUIRIES?

SWINDELL-DRESSLER CORPORATION

PITTSBURGH 30, PENNA.

Designers and Builders of Modern Industrial Furnaces



better get in touch with PAUL & BEEKMAN"

Are your sales suffering because your product weighs too much? Is your capacity limited because of the manufacturing process involved? Are your production expenses up because of high material costs? . . . Any or all of these problems *might* be solved by using the right metal stamping where you're now using another type of construction.

Paul and Beekman, Inc. *knows* metal stampings. We produce them in all types—from mild steel, stainless, copper, aluminum and brass, finished or plated to your requirements. We make them fast and we make them right, because we have the plant, the personnel and the organization to do just that.

If you think the use of precision stampings might enable you to put out a better product, faster, at less cost . . . call on Paul and Beekman, Inc. Write us for literature explaining our complete service.

PAUL and BEEKMAN, Inc.
1800 Courtland Street
Philadelphia, Pennsylvania
Subsidiary of PORTABLE PRODUCTS CORPORATION

Commerce Dept. Issues Report on Exports To Russia During 1946

Washington

• • • **Billion dollar figures** that marked exports to Russia during the war years are now mere history although exports to the Soviet Union last year ran to six times more than the prewar average of $58 million, according to a report of the Dept. of Commerce on 1946 trade with Russia.

Trade between the two countries in 1946, in dollar values, comprised $352 million in domestic exports, $5.8 million worth of reexported foreign merchandise, and $100 million in goods imported from the USSR, the report stated.

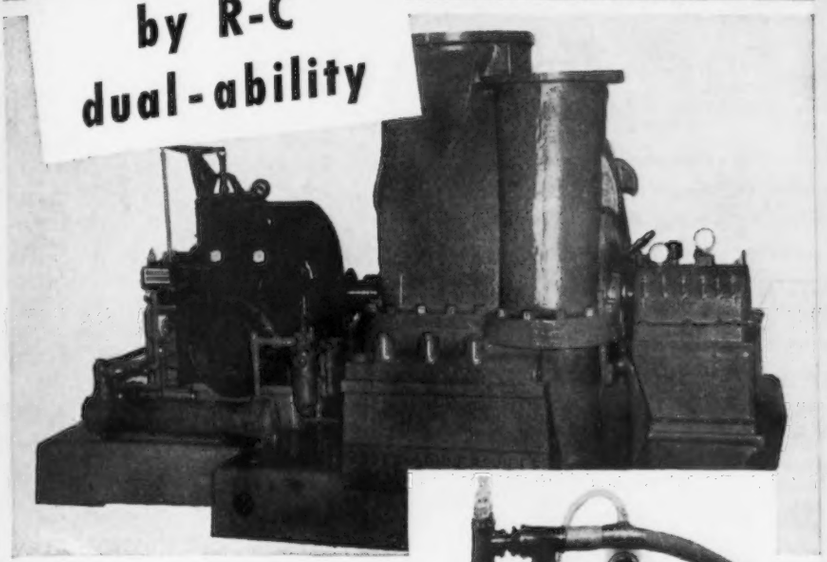
Lend-lease shipments under the "pipeline" commitments accounted for the major portion of the exports; these totaled $152 million or about 42 pct. UNRRA or relief shipments, including re-exported foreign goods, accounted for nearly as much—$141.5 million or 39.5 pct of all exports.

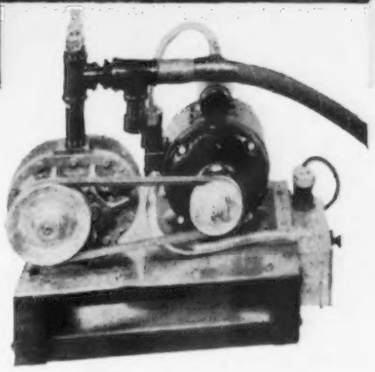
On the other hand, exports on a cash basis amounted to only about 15 pct or $53.6 million. It is pointed out by the Department that since the Russian cash purchases were to supplement the lend-lease procurements, cash exports rose in value as lend-lease dwindled, rising from $7.8 million during the first quarter to $17.6 million in the final quarter of 1946.

Russia's greatest demand has been for machinery and vehicles with about 48 pct of total exports being included under this heading; cash purchases of these goods ran as high as 54 pct. Some of the specific types most heavily represented were: Electrical, $43.8 million; machine tools, $41.3 million; internal combustion engines, $15.2 million; and, mining and pumping, $13.8 million. There were 290 steam locomotives valued at $22 million included in the group.

The next largest value in exports, exclusive of UNRRA, were metals and manufactures (exclusive of machinery) where a total of more than $22 million worth were shipped. Whereas the cash purchase figure for all exports averaged 15 pct, in this category it ran to 40 pct. Emphasized under this heading were significant quan-

by R-C dual-ability





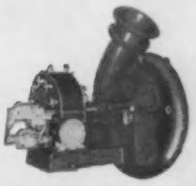
When selecting air or gas-moving equipment, watch that most important point of matching it to the job. Capacity, pressure, drive, size, weight and other factors must be carefully considered, to give you satisfactory operation.

That's where R-C *dual-ability* goes to work for you. With small-to-large sizes and many styles of both Centrifugal and Rotary Positive designs, we can be completely unbiased in our recommendations. For instance, coke oven operation called for the large Centrifugal Exhauster illustrated (top, above), with capacity of 16,850 CFM. The compact, lightweight Rotary Positive unit exactly meets the need for a low-capacity, portable vacuum pump in the graphic arts industry.

Similarly, your needs can be *matched to a "T"* with our small or large Centrifugal or Rotary Positive equipment. Call on R-C *dual-ability* to help solve your air or gas-moving problems.

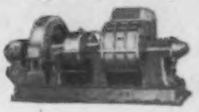
ROOTS-CONNERSVILLE BLOWER CORP.
707 Ohio Avenue, Connersville, Indiana

VARIED REQUIREMENTS OF MOVING AIR OR GAS MET BY R-C EQUIPMENT



In foundries, steel and paper mills, chemical processes, sewage treatment, gas pipe lines and many widely differing jobs, R-C *Centrifugal Blowers and Exhausters* help make more goods for more people, economically.

Many engineers find *R-C Rotary Positive Blowers* better matched to the job, with their ability to deliver constant quantities of air or gas, regardless of varying outlet pressures. Our small, compact units are widely favored for built-in application.



You can closely account for air or gas, delivered or consumed, when you measure it with *R-C Positive Displacement Meters.* Their built-in accuracy needs no adjustments, can't be altered accidentally or intentionally.

Wherever natural or manufactured gases are used in processing, you'll find *R-C Rotary Positive Gas Pumps* delivering accurate quantities by the minute or the hour with unfailing regularity.

• • •

Working with you or your suppliers, we'll apply R-C *dual-ability* to match our equipment to your jobs.

MAIL THIS COUPON WITH YOUR LETTERHEAD

Roots-Connersville Blower Corporation,
707 Ohio Avenue,
Connersville, Indiana
Please send information on:

BLOWERS_____ EXHAUSTERS_____
VACUUM PUMPS_____ METERS_____
BOOSTERS_____ LIQUID PUMPS_____
INERT GAS GENERATORS_____
NAME_____
TITLE_____

ROOTS-CONNERSVILLE ROTARY CENTRIFUGAL
BLOWER BUILDERS R-C SINCE 1854
BLOWERS · EXHAUSTERS · BOOSTERS · LIQUID AND VACUUM PUMPS · METERS · INERT GAS GENERATORS

* * ONE OF THE DRESSER INDUSTRIES * *

Triple Threat to Production Problems

HOLTITE "TAP" SCREWS

U.S. Pat. No. 2,292,195 Other Patents Pending

Chips are actually cut from material.

This newest cost-cutting innovation eliminates tapping operations by actually tapping its own perfect mating threads in any material. The slot, corresponding to the flutes of a tap, provides two balanced cutting edges that actually remove material, and a chip reservoir that allows chips and cuttings to free themselves readily. Combining the cutting action of a tap with the economy of a screw this dual purpose fastening has solved innumerable production problems. Now available in 420 Stainless Steel, heat treated. Send for illustrated folder.

HOLTITE "LOCK-TITE" SCREWS

U.S. Pat. No. 2,226,491

As the lock washer is an integral part of the head, this economy fastening automatically eliminates lost time, waste and difficulties of handling separate lock washers. "Lock-Tite" screws are made to meet specific needs of user. Design of teeth, type of metal, hardening and tempering can be regulated to obtain the most efficient locking or binding action required for the application.

Unretouched photo shows progressive "locking bite" of washer teeth as screw is driven in. When setup, screw head is securely anchored in the material to effect a tighter, stronger, vibration-resisting fastening.

HOLTITE Lubricized

Reg. U.S. Pat. Off.

WOOD SCREWS · HANGER BOLTS
SHEET METAL SCREWS

The Holtite Lubricizing process produces a hard, transparant film on the screw surface which is converted into a highly efficient lubricant by friction-heat caused through driving. When cool, this lubricizing agent again solidifies setting the screw securely in the fibres of the wood. Eliminating time-wasting hand lubricants, this processing efficiently reduces binding and breaking when fastening in hard woods and in difficult applications.

CONTINENTAL SCREW CO.

New Bedford, Mass., U.S.A.

tities of steel casings, rope, cable and tools.

Shipments of casings and other tube steel to the Soviet has drawn fire of several members of Congress and the Senate Small Business Steel Subcommittee is making a study of the matter to determine what effect Russian imports from this country might have on current shortages of these items.

On the other side of the ledger, the Commerce report shows, while undressed furs made up the largest single item imported from Russia ($67.5 million), sizable quantities of industrial raw materials were obtained. These included:

Manganese, $8.2 million; chrome, $3.3 million; platinum, $2.2 million; palladium, $1.3 million; and, lesser amounts of iridium and osmium.

Also, Russian shipments to the United States in 1946 included 963,661 oz gold ($33.7 million) and 4796 carats of diamonds ($1 million).

Conducts Experiments In Western States On Chromite Ore Samples

Washington

• • • **To determine the** best way to produce commercially-acceptable chromite from off-grade western ores, Bureau of Mines metallurgists have conducted a series of laboratory ore-dressing experiments on chromite ore samples from five western states—California, Idaho, Montana, Oregon and Washington—according to a recently released Bureau report.

Representing a part of the Bureau's wartime program for increasing domestic reserves of strategic minerals, the studies were conducted at the Salt Lake City experimental station. A dozen ore specimens from the five states were subjected to a variety of metallurgical treatments, including tabling, flotation, and magnetic separation tests. Results of the tests showed that four ores—the Fairview ore from California, Dry Camp and Sordy ores from Oregon, and the Twin Sisters ore from Washington—were amenable to the production of high quality chromite, the report reveals. The remaining eight ore samples could not be successfully treated by similar methods.

This WHEELABRATOR cleans 100,000 heat treated drills and cutters WEEKLY

With production of a large variety of carbon and high-speed drills, taps, cutters and reamers greatly increased, the Union Twist Drill Co. found that its airblast cleaning equipment was inadequate. Besides, many of these products could not be cleaned economically in existing equipment.

The installation of a 6′ PLAIN WHEELABRATOR TABLE for removing scale from the larger tools, and a 20″ x 27″ WHEELABRATOR TUMBLAST for handling the smaller pieces, satisfactorily solved the problem.

The TABLE cleans more than 100,000 pieces weekly . . . and the TUMBLAST cleans loads containing 1000 to 2000 pieces in ten minutes, whereas formerly more than four hours were required. Thorough scale removal has not only improved the appearance of all products but grinding time has been reduced as well.

Write for our free 20-page illustrated booklet, "CLEANING PROBLEMS SOLVED in the Heat Treating and Forging Industry." Contains complete case history data, comments from users, photos of Wheelabrated products, installation views and types of equipment recommended in this field.

TYPICAL PRODUCTS CLEANED

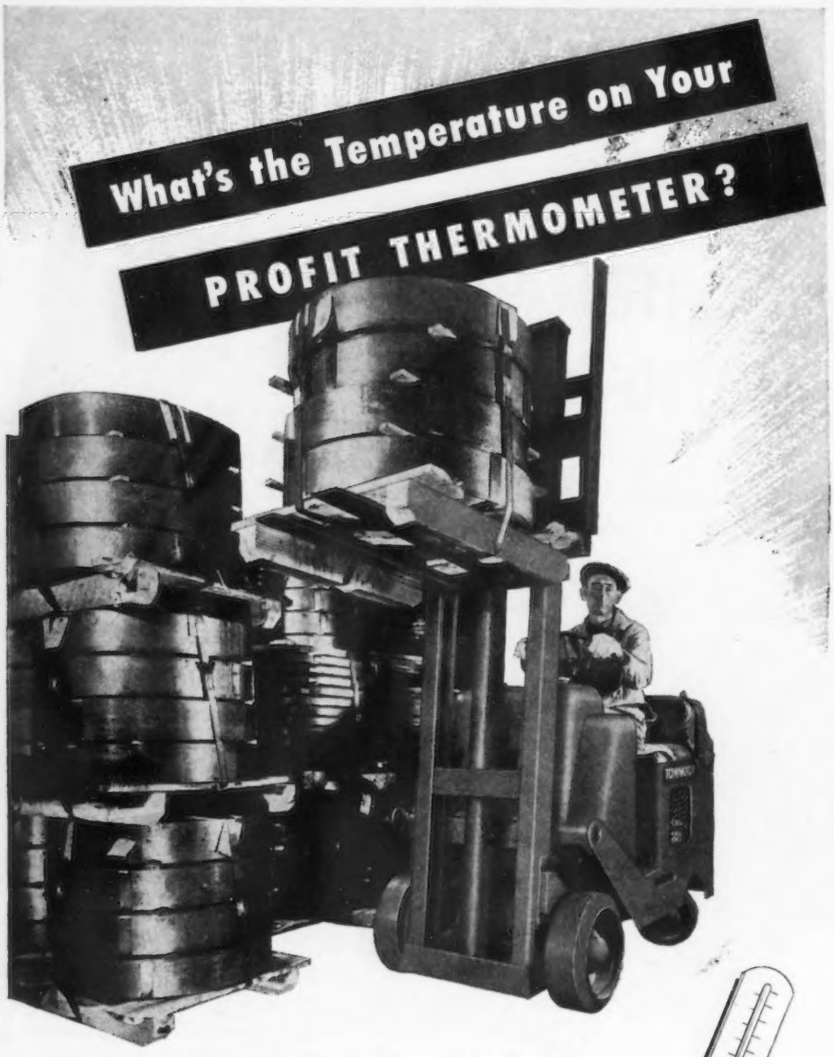
Gears • Springs • Crankshafts • Bearings • Cutlery • Chain • Drill bits • Axles • Pliers • Lockwashers • Saws • Files • Dies • Connecting rods • Shafts • Wrenches • Wheels • Shovels • Piston pins • Plowshares • Hammers • Tool bits • Reamers • Chisels • Axes • Rakes • Rifle parts • Knives • Sprockets • Pinions • Splines • Torsion rods.

TYPICAL USERS OF THE WHEELABRATOR

Wyman-Gordon Co.
Billings & Spencer Co.
S.K.F. Industries, Inc.
Plomb Tool Co.
Park Drop Forge Co.
Cushman Chuck Co.
Simonds Saw & Steel Co.
L. S. Starrett Co.
Ex-Cell-O Corporation
Caterpillar Tractor Co.

American
WHEELABRATOR & EQUIPMENT CORP.
(FORMERLY AMERICAN FOUNDRY EQUIPMENT CO.)
510 S. Byrkit St., Mishawaka 3, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT



If your profits are hovering near the zero mark, put the heat on handling. Inefficient handling will freeze up the flow of materials through production, reducing productive output. Towmotor Fork Lift Trucks and Accessories will thaw out production bottlenecks, keep materials flowing in a steady, controlled stream that keeps men and machines producing at capacity. If you're looking for "warm weather" readings on your profit thermometer, send for a Pocket Catalog. Towmotor Corporation, Division 15, 1226 East 152nd Street, Cleveland 10, Ohio.

SEND for Special Bulletins Describing the TOWMOTOR

REVOLVING CARRIAGE • SIDE SHIFTER • UNLOADER • UPENDER • SCOOP
CRANE ARM • RAM • EXTENSION FORKS • EXTENSION BACKREST
OVERHEAD GUARD

TOWMOTOR *THE ONE-MAN-GANG* **FORK LIFT TRUCKS** *and* **TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

Reveals Discovery Of Deposits of Iron Ore In Iron County, Utah

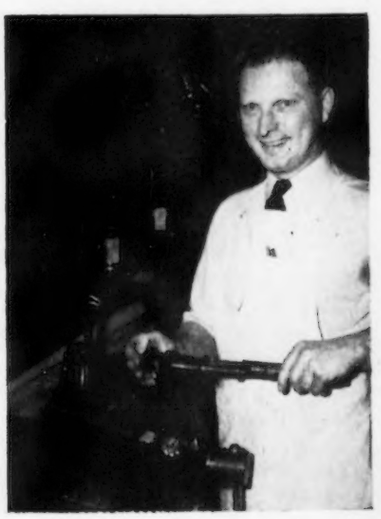
Washington

• • • **Extensive deposits** of iron ore within convenient freight distance of western smelters were discovered in Iron County, Utah, during the wartime search for domestic metals and minerals conducted by the Bureau of Mines, Dr. R. R. Sayers, Director of the Bureau, has stated in releasing a detailed report describing exploratory work in southwestern Utah.

The Bureau report describes the Pinto-Iron Springs District of Iron County as the most important known source of iron ore for the steel plants of the West and predicts that the future economic status of the Intermountain and Pacific Coast regions will depend largely upon the successful development and exploitation of substantial ore bodies in this district.

Rail connections to the principal smelters at Geneva and Ironton, Utah, are 260 miles; at Fontana, Calif., 500 miles, and at Pueblo, Colo., 815 miles. The combined requirement of the two Utah plants is estimated at 3,400,000 tons of ore annually, while the Pueblo, Colo., plant has averaged

EUREKA—A LEFT-HAND MONKEY WRENCH: *According to Harry D. Woodside, Lincoln-Mercury wood pattern maker, this 76-year-old, hand wrought wrench is a genuine "left-hander." It's right-hand thread is the reverse of ordinary wrenches. Woodside believes this should put an end to fruitless hours of searching for a genuine "left-hand monkey wrench."*



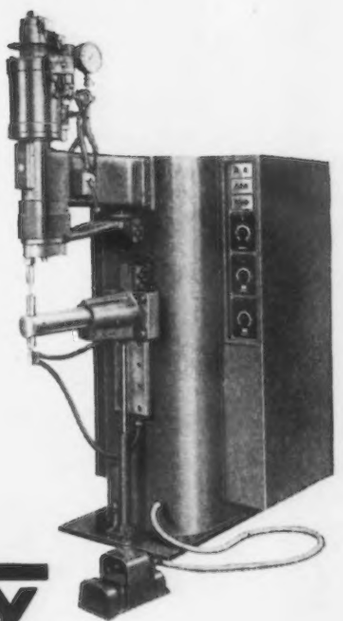
Why did "live" manufacturers invest over $1,500,000 in the past 12 months for Sciaky *Three-Phase* welders?

Because *Three-Phase* is the answer to these long-standing resistance welding problems:

WELDERS USE 75% LESS LINE CURRENT

ON A BALANCED THREE PHASE LOAD

AT NEAR UNITY POWER FACTOR



Further advantages offered by this revolutionary achievement in electronics are: elimination of "flicker" on the line, high versatility—machines can weld aluminum, magnesium, brass, etc., high efficiency is not affected by variation in throat depth or masses of steel introduced into the throat.
Get the details on Three-Phase. Write for Bulletins 136 and 137-A.

in Resistance Welding—THINK IN TERMS OF "THREE-PHASE"

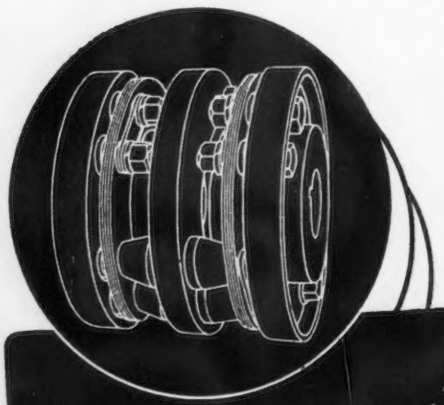
SCIAKY

SCIAKY BROS., Inc.

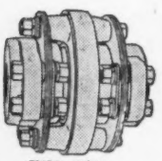
4913 W. 67th ST., CHICAGO 38, ILL.

THOMAS
Flexible COUPLINGS

are specified by engineers wherever 100% dependability is demanded



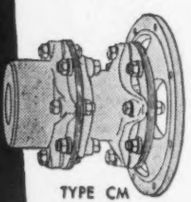
TYPE DBZ



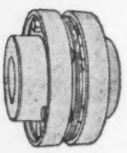
TYPE DSM

THOMAS *Flexible* COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . *and Eliminate* BACKLASH, FRICTION, WEAR and CROSS-PULL

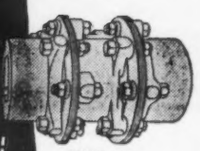
NO LUBRICATION IS REQUIRED!



TYPE CM

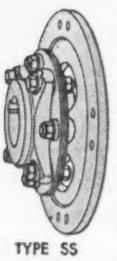


TYPE ST

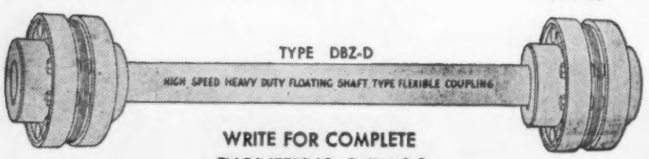


TYPE AM

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.



TYPE SS



WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

about 360,000 tons of ore annually since 1942.

As a part of the work authorized by the Strategic Materials Act, the Bureau explored more than a score of iron ore deposits in southwestern Utah between 1942 and 1945 in cooperation with the geological survey. The work comprised geological and topographic mapping, geophysical prospecting with a magnetometer, diamond drilling, trenching and test pitting, sampling ore exposures and old workings, and constructing and repairing roads.

The greater concentration of known iron ore deposits occurs in and around the margins of three mountainous uplifts—Iron Mountain, Granite Mountain, and Three Peaks—comprising a belt 3 miles wide and 23 miles long.

In addition to a description of the location and accessibility of the deposits, the Bureau report discusses physical features and climate, history, property and ownership, water and power supply, geology and ore deposits, and geophysical exploration. The report, prepared by W. E. Young, mining engineer of the Salt Lake City Div., Mining Branch, also includes numerous maps of the areas prospected as well as complete logs of drill holes made by the Bureau engineers.

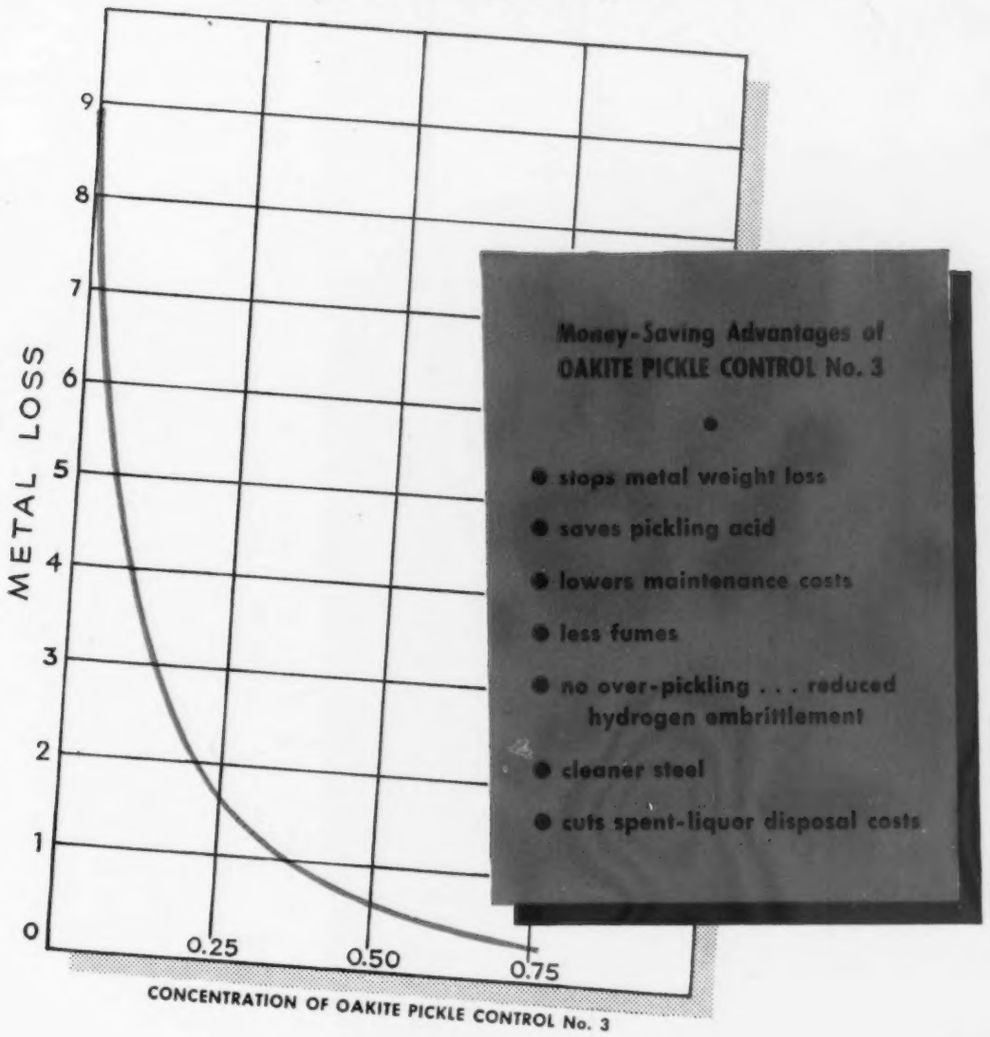
A free copy of the publication, Report on Investigations 4076, "Iron Deposits, Iron County, Utah," may be obtained by writing to the Bureau of Mines, Dept. of the Interior, Washington 25, D. C.

Britain Hopes To Up Steel Allocation To Automobile Industry

London

• • • **Mr. Wilmot,** British Minister of Supply, speaking at Coventry, much blitzed home of the automobile industry, said he hoped to be able to increase the allocation of steel for the manufacture of automobiles for the fourth quarter of the year. But he could not see much possibility of the increase being more than about 10 pct. On the question of imports, Mr. Wilmot said it had been hoped to secure 1½ million tons of steel from abroad in 1947, but owing to events in America if we got 400,000 tons that would be about the limit.

Curve* shows how Oakite Pickle Control No. 3 cuts your acid pickling costs



Oakite Pickle Control No. 3 for hot sulfuric pickling

Figure your pickling inhibitor costs in terms of tonnage saved, 'mucking out' charges reduced, extended life of acid solutions . . . and you'll find Oakite Pickle Control leading the field.

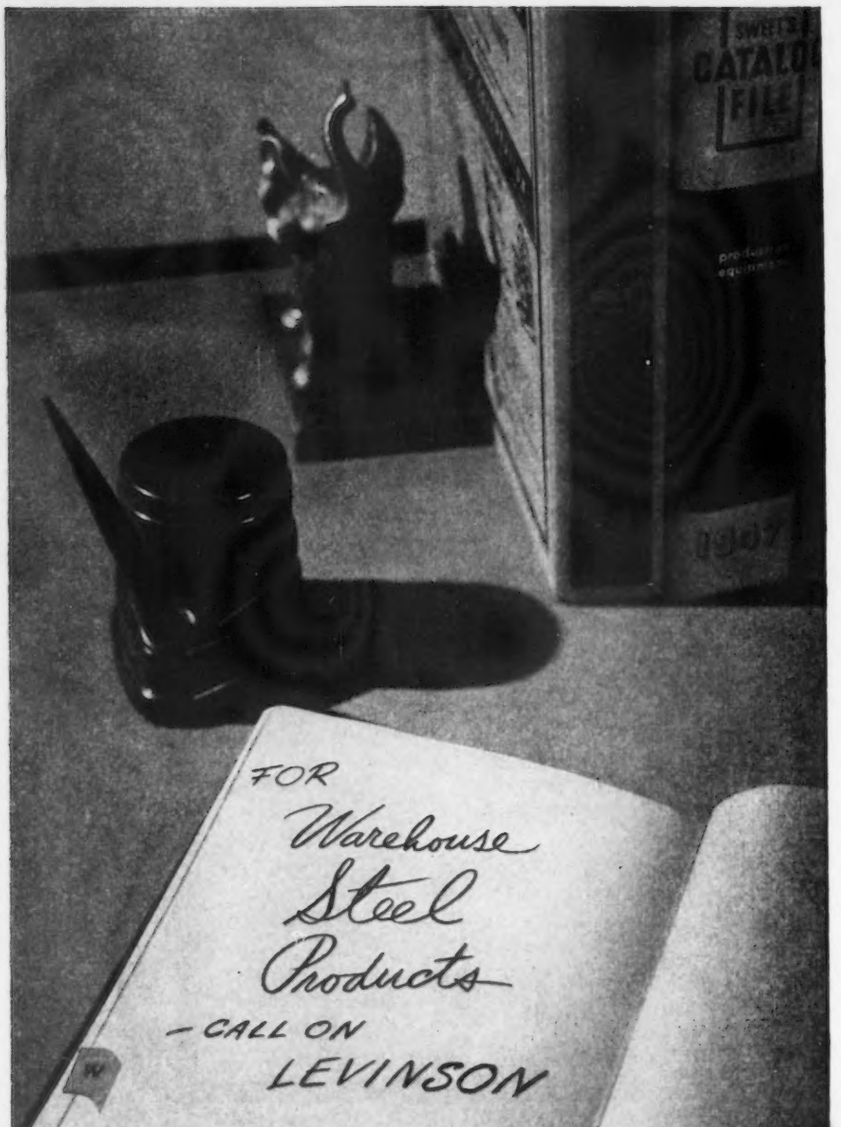
Oakite Pickle Control No. 3 more than pays its way. To its cost benefits, add these work-improving advantages: smooth, uniform pickling; the elimination of blisters on sheet or strip steel; the minimizing of "acid brittleness" in pickling wire. Performs efficiently and economically at concentrations of 0.5 to 1.0% by weight of the concentrated acid used in a pickling bath.

Write TODAY for detailed, free data on use and control, plus helpful information on pickling tank make-up. Or see the Oakite Technical Service Engineer nearby.

* curve shows relationship of metal loss (in grams per sq. decimeter per hr.) to concentration of Oakite Pickle Control No. 3 (percent by wt.); based on wt. of 100% sulfuric acid *Metal:* SAE 1035 *Time:* 1 hr. *Temp:* 180° F. *Acid:* 66° Be' sulfuric, 5% by volume.

OAKITE PRODUCTS, INC.
30H Thames Street, NEW YORK 6, N. Y.
Technical Service Representatives Located in Principal Cities of United States and Canada

OAKITE
Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE



LEVINSON
STEEL SALES CO.
PITTSBURGH, PA.

ALSO DISTRIBUTORS OF PLASTEEL ROOFING, BATES OPEN STEEL FLOORING, THORN STEEL WINDOWS

Appeals For Greater Allocation of Steel Made By Farmers

Washington

• • • **Increased pressure** will be brought to have the steel industry allocate a greater ratio of steel to manufacturers of agricultural equipment, particularly tubular products, according to Capitol Hill sources. Congressmen have been deluged with complaints from the Midwest that farmers are unable to get sufficient well casings and water pipe to maintain present production levels.

Unless they get more immediately, they declare, livestock herds must be reduced and crop acreage curtailed in those regions where underground water is a production factor. This would mean higher food prices and increased shortages.

That the lawmakers are greatly concerned is evident in the way they have kept close watch on the hearings conducted by the Martin steel subcommittee. Some, including Senators Thye, R., Minn., and Ecton, R., Mont., have appeared personally and make statements before the committee.

Among reasons advanced for the current acute shortage is that wells and pumping machinery were overworked to the point of breaking down, both during and since the war. It is estimated by suppliers that at least 50 pct of existing wells in the seven-state critical area need replacement now and over the next few years.

Not mentioned, however, is another major reason for the present high demand for replacements. It is simply that the farmers were slack in both maintenance and replacement during the low demand period of the '30s; now, with high demand and equally high prices for their products, immediate replacement is desired for needs which have been 15 years accumulating. As a result, suppliers estimate that farm demand for such products is 600 pct or more over prewar requirements.

Like other segments of steel-consuming industries, it has been charged that agricultural needs, especially casings and pipe, have been discriminated against and do not receive their proper ratio of the total output. This is indignantly denied by steel officials who

say that if anything, the reverse is true.

For instance, figures have been offered by National Tube to show that during 1946 this firm shipped 27,000 tons of farm type piping into the seven-state area as compared with the average of 21,500 tons for the 1937-41 period. At the present rate of shipment (first 5 months 1947), the total for this year should reach 29,000 tons, a third more than the prewar average.

The answer is the same as for other segments of industry—there simply isn't enough steel to meet all needs. Overlooked in the plea for more farm type tubular products is the probability that present facilities for well-drilling and laying pipe could handle no more than 20 pct increase in output, even were steel companies willing to divert production.

There is no indication that diversion would be considered. It would have to be done largely at the expense of the oil and gas industries which in turn would adversely affect production of the steel companies themselves.

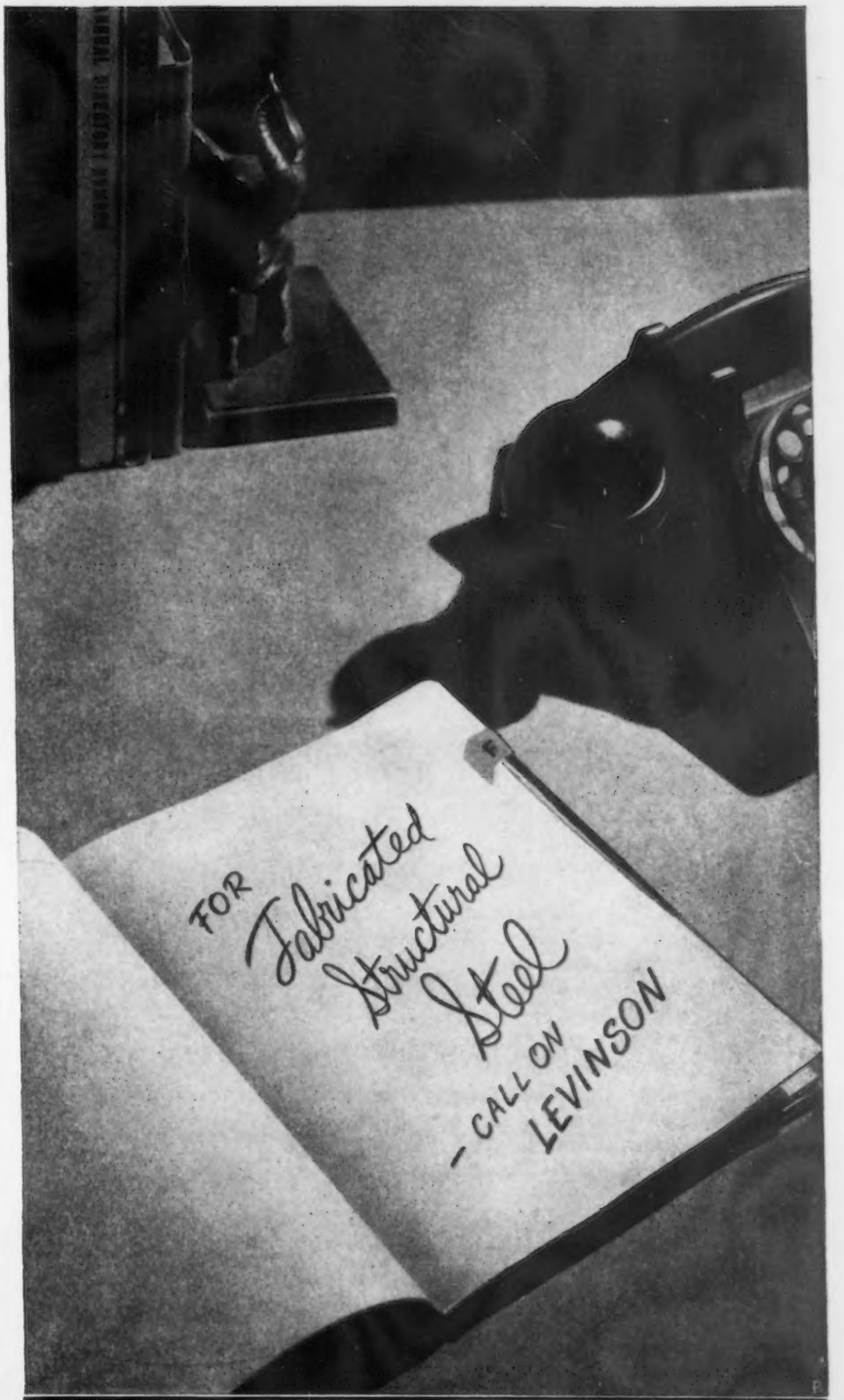
Stadium Introduces New Steel Backstop

Detroit

• • • **Briggs Stadium,** home of the Detroit Tigers, has introduced the first stainless steel backstop in a major league baseball park. The new screen weighs more than 3500 lb. According to Detroit Baseball Club officials improved visibility for spectators, elimination of eyestrain and improvement in the desirability of seating spectators behind home-plate have been gained by the new installation.

The screen, which is permanent and not removable, covers an area of 6089 sq ft. Wire cables for the new screen are made of stainless steel. The screen mesh is 2 in. x 4¾ in. The wire is ⅛ in. and 5/32 in. Highest point of the installation is 75 ft. Width at the top of the screen is 85 ft and width at the field boxes is 56 feet.

Engineers estimate the new screen may be called upon to carry an iceload of as much as 7500 lb. The screen formerly used at Briggs Stadium in Detroit was made of poultry netting and cord fish netting.



The LEVINSON STEEL COMPANY
PITTSBURGH, PA.

ALL TYPES OF STRUCTURAL AND MISCELLANEOUS STEEL FABRICATION

PAGE *Stainless Steel* WIRE

Yes, a lot of the stainless steel wire that is serving the country as part of manufactured products, came from Monessen, Pa. That's PAGE headquarters.

During the many years we have been working with stainless, we have learned much about the applications of stainless steel wire in manufacture. That's why we suggest that when you have a problem involving wire, it will pay you to . . .

Get in touch with Page!

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

Research Center For Small Firms Opened

London

• • • **The Fulmer Research** Institute at Stoke Poges, Buckinghamshire, was opened recently by the President of the Board of Trade, Sir Stafford Cripps. The objects of the institute are to provide a research center where firms can use first-class facilities and a team of scientists of wide knowledge and experience to carry out research work on their behalf, the results of which remain their property.

The institute is non-profit making. At present it confines itself mainly to the metallurgical field, but it may eventually expand in other directions. It is intended to be used mainly by relatively small firms which could not afford to set up a research department of their own.

GM Reports Increase In Car, Truck Output

Detroit

• • • **A significant** increase in production of passenger cars and trucks in June over May has been reported by General Motors Corp. GM turned out 155,609 units in June compared with 135,276 in May.

For the first 6 months of 1947 General Motors produced 921,929 cars and trucks in the United States and Canada.

During the month of June, Chevrolet Div. turned out 81,423 units. Buick production was 23,013, the Pontiac assembly total was 19,910 and Oldsmobile turned out 17,459 passenger cars.

For the 6 months ended June 30, Chevrolet built 486,403 passenger cars and trucks, according to the GM announcement. Buick production was 125,890 followed by Pontiac with 110,127 and Oldsmobile 95,701.

Cadillac output for the period was 28,689, while GM Truck & Coach assembled 32,106 trucks and 2250 coaches. GM's Canadian plants assembled 29,420 passenger cars and 11,343 trucks during the period.

Total GM production for the first 6 months of 1947 of 921,929 may be compared with 1,495,208 for the first 6 months of 1941 and 1,142,830 for the same period of 1940.

R. W. Johnson Sharply Criticizes the Labor Policy of the NAM

Washington

• • • **Robert W. Johnson,** chairman of Johnson & Johnson of New Brunswick, N. J., said recently that one of the principal roots of labor-management troubles was destruction of human dignity, and declared "the task of restoring dignity to workers rests squarely upon management."

Speaking at a labor relations forum Mr. Johnson criticized the philosophy of the National Association of Manufacturers for some of the things it leaves unsaid, and deplored proposals for a statutory minimum wage of 65 cents an hour on grounds that it was inadequate to support a small family in decency.

"The time has come," Mr. Johnson said, to accept the truth that those who earn less than a subsistence living are a liability to society. Modern society must pay this bill. As business, meaning the national economy, must pay this bill anyway, why not pay it at the source through adequate wage-hour legislation?

STEELWORKERS IN HUNGARY: *Imre Batto, left, is the Communist workers' representative at the Manfred Weiss steel works in Hungary. His 48 hr week nets him the equivalent of* $14.05 *per week. Istvan Weiland, stamping operator at* $8.52 *for a similar week, works at the Csepel Island plant.*

IF THE GEARS IN YOUR PRODUCT ARE *custom-cut* BY PERKINS...

You can stake its reputation on its trouble-free power transmission

• Great as the demand has been . . . large as the quantities produced have been, Perkins Custom-Cut Gears are, first and foremost, the product of a reliable gear-engineering organization.

The key-personnel is largely composed of New England craftsmen who have learned their business the hard way — through experience in the shop as well as appropriate schools. While we by no means wish to imply that the men at our disposal constitute a monopoly of the country's gear engineering brains, we do believe that we are capable of producing custom-cut gears which will stand up well under any comparative test.

• **PERKINS MAKES** — **In All Materials, Metallic & Non-Metallic** Helical Gears, Bevel Gears, Ratchets, Worm Gears, Spiral Gears, Spur Gears, Ground Thread Worms

PERKINS MACHINE & GEAR Company

Springfield 2, Massachusetts

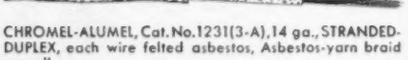
You Furnish the Specifications
•
We'll Produce the Gears!

Precision Quality!

Immediate Shipment

GORDON THERMOCOUPLE EXTENSION LEAD WIRE

There are two good reasons why we stress Gordon Quality and Gordon Service. (1) The precision quality of Gordon Thermocouple Extension Lead Wire is based upon 32 years of experience in careful selection and inspection to meet rigid insulation requirements. (2) Gordon's Chicago and Cleveland plants carry complete stocks of Thermocouple Extension Lead Wire for practically every application. (See illustrations below.) This means that your order gets immediate delivery of a QUALITY product—one that meets Bureau of Standards Specifications. ORDER NOW! No waiting or delay. Prices available upon request.



CHROMEL-ALUMEL, Cat. No. 1231(3-A), 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

FOR PLATINUM THERMOCOUPLES, Cat. No. 1225, 16 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

CHROMEL-ALUMEL, Cat. No. 1234, 14 ga., SOLID-DUPLEX, each wire enamel, felted asbestos, Asbestos-yarn braid overall.

IRON-CONSTANTAN, Cat. No. 1236-C, 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

COPPER-CONSTANTAN, Cat. No. 1235-A, 14 ga., SOLID-DUPLEX, each wire cotton, rubber, weatherproof braid, lead sheath overall.

GORDON SERVICE

CLAUD S. GORDON CO.

Specialists for 32 Years in the Heat Treating and Temperature Control Field

Dept. 16 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 16 • 7016 Euclid Avenue • Cleveland 3, Ohio

Mr. Johnson who served in Army Ordnance as chairman of the Smaller War Plants Corp. and vice chairman of the War Production Board, said the future of the American economic system was a race between elimination of labor-management conflict and catastrophe.

"We can sit still until catastrophe comes," he added. "We can hasten catastrophe by demanding blind reaction. Or we can join sectors of business such as the American Management Association, the Committee for Economic Development, and the National Planning Association, which understand the problem and are attacking it. Five years of constructive work can put us on the road to successful collaboration between labor and management. Five years of muddling may rob us of our last chance."

He called for a program of adult training and education that will "improve the skill of workers, fit them for better jobs and give them a better understanding of our modern industrialized society."

Mr. Johnson said he differed with the labor-management philosophy expressed in "The American Individual Enterprise System," a work analyzing the American economic structure, recently published by the NAM. He contended the book "advocates a return to the hands-off economics of the 1800's which would reduce labor to a commodity that can be sold, bought, and scrapped like so much machinery. . . .

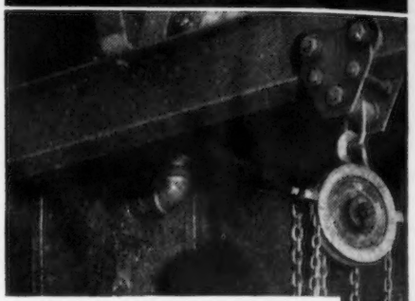
"True, there are five sentences which say that the boss and his workers must be fair with each other, that mutual good-will is important, that supervisors should be tolerant, and that the worker should be treated as a person who can give advice and who needs a chance for advancement. There also is a statement by Ira Mosher, chairman of the NAM board, that the authors base their whole approach 'on the dignity, indeed on the sanctity, of the individual.'

"There is not one word to tell how fairness and good-will can be built, how supervisors can be taught tolerance, or how workers can be qualified for advancement. Nor is there the slightest hint that dignity has been destroyed by a philosophy which too often has put

LET READING HOISTS

HANDLE WITH CARE

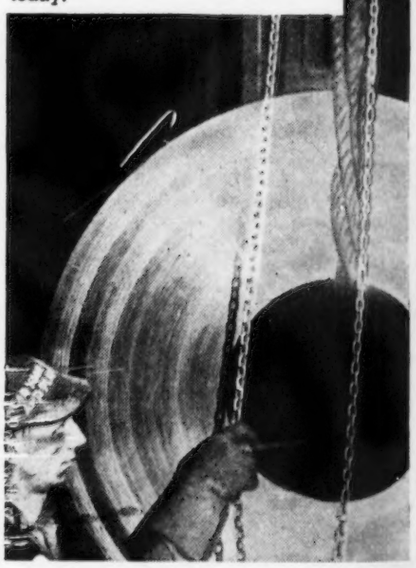
. . . AT LESS COST!



● In your plant, unsafe handling of easily-damaged materials can often result in higher manufacturing costs and lower product quality.

Reading Multiple Gear Chain Hoists position your materials with the highest degree of money-saving safety and accuracy. Sturdy maple brake wheel inserts hold any load from ¼ ton to 25 tons snugly against the friction disc until the load is to be moved. Maximum lifting power plus a safe, constant-speed lowering motion have given Reading Hoists wide user acceptance for the past 40 years.

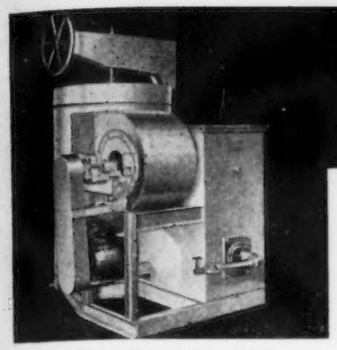
Assure yourself of these and many more advantages—see your distributor or write us direct, today.



READING CHAIN & BLOCK CORPORATION
2101 ADAMS ST., READING, PA.
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

Sunbeam STEWART

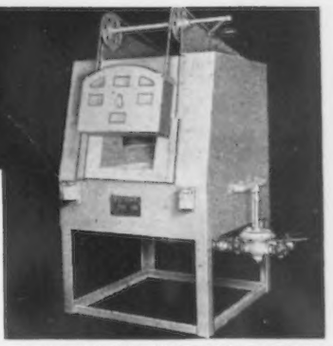


BASKET RECIRCULATING FURNACE

Small tools, dies, or anything small enough to be most conviently handled in batches, can be easily tempered or stressed relieved quickly and uniformly in this Sunbeam Stewart unit.

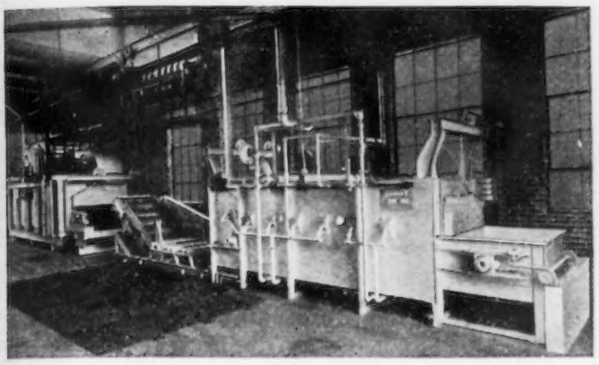
There is a Sunbeam Stewart Industrial Furnace for Every Need

Forging • Carburizing • Case Hardening • Tinning • Normalizing • Brazing • Rod Heating • Lead Hardening • Billet Heating • Oil Tempering • Plate and Angle Heating • Soft Metal Melting • Hardening High Speed Steel • Galvanizing • Stress Relieving • Rivet Heating • Brass Melting • Annealing • Salt Bath Hardening • Cyanide Hardening • Hardening Carbon Steel



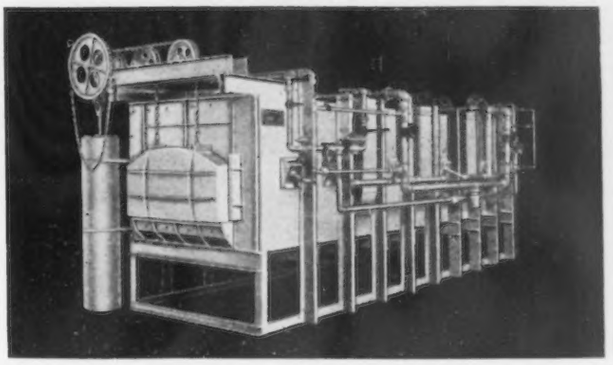
SEMI-MUFFLE AND FULL-MUFFLE OVENS

Where special atmospheres are required, Sunbeam Stewart Semi-muffle and Full-muffle Furnaces (with patented seal-tite door) are recommended.



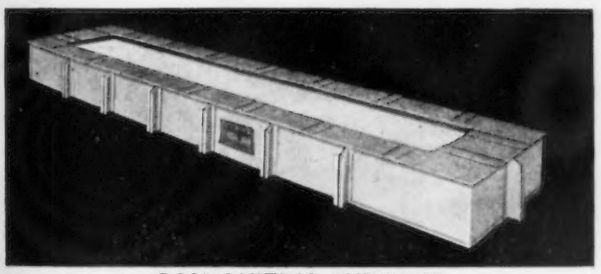
HARDENING, QUENCHING AND DRAWING UNIT

A representative Sunbeam Stewart automatically controlled continuous conveyor type hardening, quenching and drawing installation. Has automatic temperature control, wide operating range, variable production capacity and automatic handling through all operations.



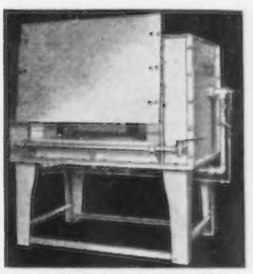
HEAVY PORTABLE OVEN FURNACE

Rugged, heavy-duty casing, lining and insulation, combined with the carefully engineered combustion, atmosphere and temperature control make Sunbeam Stewart Heavy Portable Oven Furnaces outstanding in production and uniform results. Available in under-fired semi-muffle, or over-fired construction.



GALVANIZING FURNACE

Typical of the many installations Sunbeam Stewart has engineered for galvanizing wire, sheet, hollow-ware, tanks, pipe fittings, plumbing fixtures, etc. Features of these settings are the long pot life, low dross loss, and high production made possible by the Sunbeam Stewart principle of "high-firing" with baffle protection for pot.

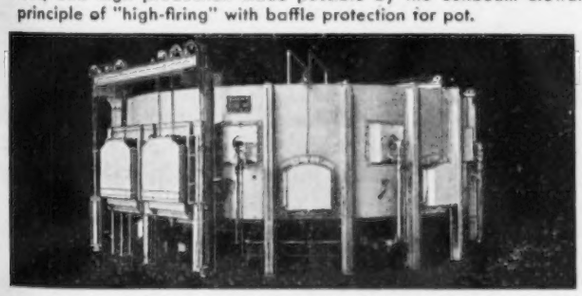


OPEN SLOT FORGE

Designed for drop hammer work or similar operations requiring a continuous feed of heated work. Also especially suitable for end heats. Design of heat shield and air blast provides maximum of comfort for operator.

ROUND POT FURNACES

Such processes as lead, cyanide, and salt bath hardening, oil or salt tempering are carried out in thousands of these versatile units. Easy temperature control, uniformity of temperature, and long pot life are features of this unit.



ROTARY HEARTH FORGE

Circular tunnel-type rotary hearth is sand-sealed and friction driven at three points. Engineered to meet large heavy-duty production requirements, this installation guarantees the thorough even heat good forging and piercing practice requires.

FREE

"Guide to Furnace Selection"

Has the answer to the type of gas or oil-fired furnace best suited for your requirements. Write Sunbeam Stewart Dept. 110 for this handy furnace guide today.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(*Formerly* CHICAGO FLEXIBLE SHAFT CO.)

Main Office: 4433 Odgen Ave., Chicago 23 — *New York Office:* 11 W. 22nd St., New York 18 — *Detroit Office:* 308 Boulevard Bldg., Detroit

Canadian Factory: 321 Weston Rd., S., Toronto 9

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

HANNIFIN

Engineered—

to help you

CUT PRODUCTION COSTS!

CUT production costs and boost plant output—you can do it with Hannifin "JOB-TESTED" Hydraulic Presses! Hannifin offers standard and special types of presses for every purpose: straightening . . . press-fit assembling . . . forming . . . molding—in capacities up to 150 tons. Built in a wide variety of open gap and two, three, and four column styles, complete with motor-driven pump and all necessary gauges and controls. Standardized designs for earlier delivery, lower cost. Quality construction for low maintenance, long life.

Everything you want for better, more accurate, more convenient operating control! Hannifin's *exclusive* Sensitive Pressure Type or arranged to meet the requirements of the operation.

Ask for a copy of Bulletin No. 60-S. See your local Hannifin representative or write for complete information and recommendations.

ONE OF MANY DIFFERENT TYPES:
75 ton Hannifin forcing press with built-in hydraulic power unit and *"Sensitive Pressure Control."*

HANNIFIN CORPORATION
1101 So. Kilbourn Ave., Chicago 24, Ill.
AIR CYLINDERS • HYDRAULIC CYLINDERS
HYDRAULIC PRESSES • PNEUMATIC PRESSES
HYDRAULIC RIVETERS • AIR CONTROL VALVES
Nationwide Sales and Service

ARMSTRONG *Drop Forged* LATHE DOGS

ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head of safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

ARMSTRONG BROS. TOOL CO.
309 N. Francisco Ave., Chicago 12, U. S. A.
San Francisco and New York

profits above justice and humanity."

The speaker said this would be gravely disturbing if it came as the mature opinion of American employers, but he said the NAM group does not represent thousands of business men who "believe that we can and must have decent relationships between labor and management.

"Until we restore dignity of the individual worker and his associations or union, we can have neither progress nor industrial peace."

Monsanto Develops New Space Saving Insulant Used in Refrigerators

Everett, Mass.

• • • **Capacity of the** average household refrigerator can be increased from 7½ cu ft to 11 cu ft by cutting down wall thicknesses normally taken up by bulky insulating material. Savings in space is possible due to a scientifically unique form of matter into a space saving insulant, according to Monsanto Chemical Co., its developer.

The insulant (described by chemists as an aerogel and trade named Santocel) is a powdery substance from which all liquid matter has been removed without destroying the miscroscopically small honeycomb of individual cells which make up the substance. When all the liquid is removed the cell walls contain 94 pct "nothing."

According to Monsanto technicians, Santocel is the only product with a thermal conductivity lower than that of still air. Conceived about 15 years ago, the product has been under research and development at the Monsanto laboratories in Everett. It was initially developed for large commercial units demanding very high efficiency. Recent production improvements and refinements, however, have made the product practical for use in the average refrigerator or freezer.

The first step in the production of Santocel is the reaction of sodium silicate and sulfuric acid to form silica jelly. This substance is a two phase material of water mixed with a solid phase of silica. Through the use of high temperatures and pressures, the water is removed from the silica jelly and is

replaced by air without destroying the jell structure. In the structure, pore spaces which contain the air are smaller in diameter than the average distance a molecule travels in air before striking another molecule. Thus, molecular motion and consequent heat transfer is reduced in the new insulating material.

Production in Canada Of Pig Iron During May Held at About 70 Pct

Toronto

• • • **Canadian pig iron** production for May held at an average of 70 pct of rated capacity, which is practically the same rate as in the preceding month and for May 1946. In the month under review output totaled 160,230 net tons against 160,749 tons in April and 159,101 tons in May last year. Output for the month included 123,962 tons of basic iron of which 114,512 tons were for further use of producing companies and 9450 tons for sale; 23,890 tons of foundry iron, 23,500 tons for sale and 390 tons for further use, and 12,378 tons of malleable iron, all for sale.

During May one furnace was blown in to make 11 stacks blowing at the first of June out of a total of 14 in Canada. Charges to blast furnaces in May included 310,121 tons of iron ore; 11,665 tons of mill cinder, scale, sinter, etc., and 5074 tons of scrap iron and steel.

For the first 5 months this year pig iron production rose to 813,327 net tons from 746,133 tons in the corresponding period of last year and compares with 782,917 tons in the 1945 period.

Production of ferroalloys in May amounted to 15,325 net tons against 13,015 tons in the previous month and 14,069 tons in May 1946. Output for the month included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus. For the 5 months ended May 31, cumulative production of ferroalloys totaled 61,538 net tons as compared with 57,307 tons in the 1946 period and 80,199 tons in 1945.

Following are comparative monthly production figures for 1947 in net tons:

	Pig iron	Ferroalloys
January	177,313	9,644
February	150,623	9,357
March	164,403	14,197
April	160,749	13,015
May	160,230	15,325
Total	813,327	61,538

2 STEPS in Cutting Costs of Handling Bagged Material

1 Install BAKER Fork Truck and Pallets

This will eliminate the back-breaking labor of handling individual bags manually, cut time and cost of car-loading or unloading, add storage space by tiering, and speed inter-department handling.

2 Get Suppliers to Palletize Shipments

This will cut time and cost of unloading incoming material. Supplier will make corresponding savings at shipping end with Fork Truck-Pallet combination. Damage in transit minimized.

Baker Fork Truck tiering pallet loads of bagged starch in storage. Note method of "locking" sacks to prevent side-slipping.

AT THE ERIE, PA. PLANT of one of our customers, raw materials such as clay, starch and talc, are received in bags. A typical carload will contain some 1600 bags, weighing about 50 lbs. each. These bags must be unloaded, stored, and transported to process departments as required.

This company took Step No. 1 years ago, and from the receiving point all bagged materials are carried in unit loads on pallets by fork truck. This has resulted in substantial savings each time the material is handled and has increased warehouse capacity by permitting high tiering. But bags not on pallets when they arrive must first be palletized—an operation requiring about 14 hours per car.

Step No. 2 is now under way. Arrangements are being made with all suppliers of bagged materials, to ship in unit loads, on pallets. Such carloads can be completely unloaded and stored in not much over two hours—as against 14 hours for palletizing alone. Since no individual man-handling of bags is required, heavy labor is eliminated, and damage from handling and shipping is minimized. Comparable savings are realized by suppliers at the shipping end, making it possible to improve deliveries.

Savings possible by complete palletization are demonstrated at the same plant in the case of shipping cartons. For these, which arrive in "knock-down" condition, the company furnishes the supplier with special four-way pallets—and the "flats" arrive in unit loads strapped to these pallets. Unloading and warehousing now takes about three hours per car, where formerly, when "flats" were received unpalletized, it took 24 man-hours for the job.

Let a Baker Material Handling Engineer show you how you can save money with fork trucks and pallets.

EITA

Members Electric Industrial Truck Association

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2175 West 25th Street • Cleveland, Ohio
In Canada: Railway & Power Engineering Corp., Ltd.

Baker INDUSTRIAL TRUCKS

Perforated Strainers and —

HENDRICK is fully equipped to fabricate a wide range of products from perforated plate, that also involve shaping, forming, welding, riveting, brazing, etc. The pump strainer illustrated is a typical example.

For such operations Hendrick has an exceptionally large stock of dies and patterns, complete tool equipment, and ample forming and welding facilities.

Write for detailed information.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

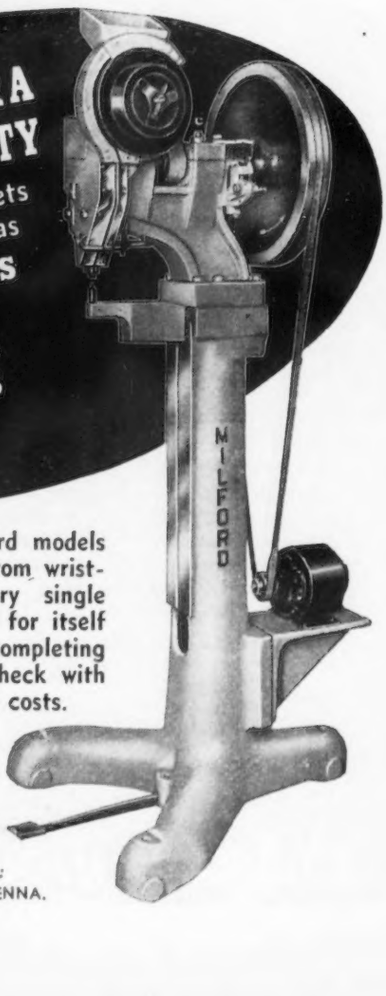
MILFORD FASTENING EQUIPMENT

MODEL No. 300-A

FOR EXTRA HEAVY DUTY

sets semi-tubular or split rivets in such diverse assemblies as

WASHING MACHINES
STEAM PUMPS
SKATES • SAWS
REFRIGERATORS
CHAINS, etc.



Here is another of Milford's 15 standard models of rivet-setters for assemblies ranging from wrist-watch bracelets to refrigerators. Every single Milford rivet-setter has more than paid for itself either in cutting costs of assemblies or completing them faster. For any fastening need, check with Milford — for ideas to save time or cut costs.

THE MILFORD RIVET & MACHINE CO.

863 Bridgeport Avenue, Milford, Conn.
1006 West River Street, Elyria, Ohio

Inquiries may also be addressed to our subsidiary:
THE PENN RIVET & MACHINE CO., PHILADELPHIA 33, PENNA.

Urges Amortization Of Machine Tools Used In War Output Be Given

Cleveland

• • • **For the next** few years many of the contract tool and die shops must spend considerable money in the modernization and re-equipment of their plants, George S. Eaton, executive secretary, National Tool & Die Manufacturers' Assn., told the House Committee on Ways and Means recently.

In presenting testimony in favor of legislation granting further opportunity for the amortization of facilities used in war production, Mr. Eaton pointed out that machine tools which had been used far past their normal useful life were repaired as quickly and inexpensively as possible during the war and put back into service.

"New machine tools purchased during the emergency received much abuse and were ill-treated to the point where their useful life was greatly diminished insofar as the precision work of the tool and die shop is concerned," Mr. Eaton said.

He told the committee that since the end of the war, a considerable volume of surplus machine tools has gone into these shops, but there has been nowhere near the replacement that should be made, because of the lack of cash reserves.

"The accumulation of cash assets during the high production of the war period was surprisingly low, as the 80 pct maximum tax rate and renegotiation siphoned off most of the profits," he declared, adding that refunds received now would finance in part the vitally needed modernization.

Mr. Eaton pointed out that the amortization of the cost of the equipment used in war production can also be handled through the allowance of accelerated depreciation by the Bureau of Internal Revenue for the years included in the emergency period, and urged that the Committee take favorable action to make this method effective.

"It would seem most elementary that increasing the hours of usage of a machine would result in accelerated depreciation," Mr. Eaton declared.

In the tool and die shops during the war the hours of work were

usually at least doubled and operation by inexperienced or less skilled workmen and the impracticality of taking time for adequate repairs and overhauling were also contributing factors, he said.

He pointed out that after World War I the Board of Tax Appeals repeatedly allowed much higher than normal depreciation, doubling and almost trebling the peacetime allowance.

"The Bureau of Internal Revenue, however, has consistently refused to follow these precedents and even now is going over the returns of various metal-working plants and insisting that rates of depreciation formerly approved for peacetime-one-shift years actually be reduced during the wartime years," Mr. Eaton charged.

He said machine tools and other equipment in tool and die shops should be in the best of condition and that machines that would be satisfactory for production work may not be usable at all on special tooling because of the impossibility of doing precise work.

"Consequently, the useful life of a machine in a tool and die shop is not determined by its ability to operate but by the time during which it can efficiently perform the precision work required."

Mr. Eaton stressed the importance of a change in policy on the part of the BIR that will end the persecution of small businessmen by the Bureau's agents.

He said conditions existing in the reviewing of some income tax returns are "deplorable" . . . "some field agents are fair, but so many are unwilling or unable to exercise any judgment or discretion in the interest of equity."

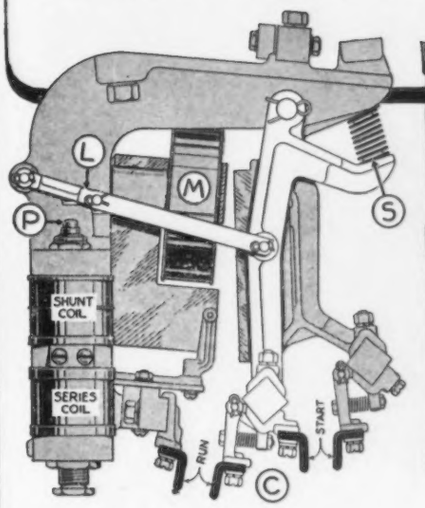
"They are inbued with the idea of collecting every single dollar possible, and if their contention on one point is battered down, they intensify a search for something else that can be used to counter the law.

"Except for the ups and downs of individual corporate profits, it should make no substantial difference to the government in the long run, from the tax standpoint, whether the cost of a machine is charged off in 5 years or in 20 years," he stated.

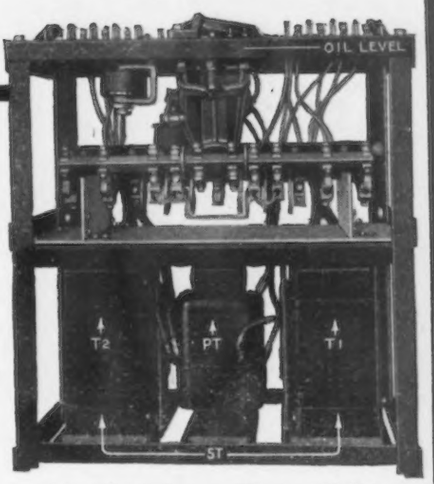
Mr. Eaton urged that H. R. 1538 be enacted allowing another opportunity to obtain a certificate of necessity.

Under a certificate of necessity,

Inherent Interlock between Start and Run Promotes Safety, Reduces Maintenance on This 2300-Volt Motor Starter



Side view of Contactor.



Potential transformer (PT) mounted between auto-transformers (T1 & T2) supplies low voltage for the Push Button circuit.

THIS EC&M automatic Motor Starter for reduced voltage starting of 2300 volt squirrel-cage or synchronous motors uses a simple double-throw contactor (C). The interlock (L), between the starting and running contacts, is inherent in the basic design.

The single operating magnet (M), when energized by the push button, closes the starting contacts, connecting the motor to reduced voltage. When the motor accelerates to the proper speed, a current limit relay raises plunger (P) to trip the mechanical interlock (L). The running contacts then close, connecting the motor across the line. During transition, continuous torque is applied to the motor.

There is no other starter built like this EC&M automatic. Magnetic overload relays of the non-creeping, drop-back type are enclosed above the conduit connection box. Door permitting access to them is arranged for padlock. Meters are optional. Investigate these 2300 volt starters. Bulletin 1047-C, describing them, will be sent promptly on request.

BULLETIN 1047-C STARTER IN STANDARD TYPE II (drip-tight) ENCLOSURE.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

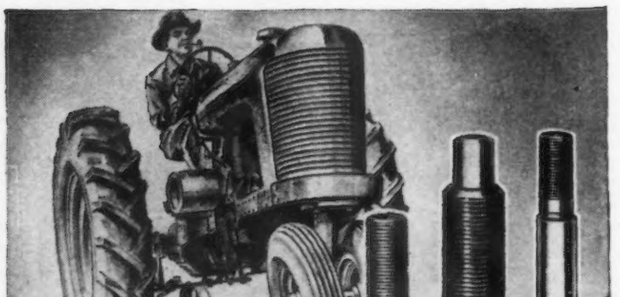
Aircraft Wire—tinned or alloy coated and galvanized
Armature Binding Wire—tinned or alloy coated
Belt Hook Wire—tinned, galvanized or alloy coated
Bobby Pin Wire
Brush Wire—round scratch brush, tempered and untempered. High strain white liquor finish
Card Wire—tempered, round, angular, single convex, double convex
Curtain Spring Wire—round, flat
Fish Leader Wire
Flexible Shaft Wire—Music Wire quality
Hard Drawn Spring Wire
Heddle Wire
Hose Reinforcement Wire
Mandolin Wire
Music Wire, bright, tinned or alloy coated
Piano Wire, perfected quality
Rope Wire, bright or galvanized, mild plow, plow, improved plow
Seal Wire • Stainless Steel Wire
Stapling Wire • Stitching Wire
Tire Wire—bronze plated

Your nearest Johnson branch will give you prompt service.

JOHNSON
STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.
NEW YORK AKRON DETROIT CHICAGO LOS ANGELES TORONTO

ERIE SPECIAL BOLTING FOR HEAVY MACHINERY

FOR over 30 years ERIE has specialized in the manufacture of *high quality bolting*. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists—send us your bolting specification for our estimate.



for FARM EQUIPMENT

A DEPENDABLE SOURCE OF HIGH QUALITY BOLTING FOR RAILROADS, REFINERIES, DIESELS, FARM MACHINERY, EXCAVATING EQUIPMENT AND ALL TYPES OF HEAVY MACHINERY.

ERIE BOLT & NUT CO.
SUBSIDIARY OF BARIUM STEEL CORPORATION
ERIE, PA.
STUDS • BOLTS • NUTS ~ ~ ALLOYS • STAINLESS • CARBON • BRONZE

facilities covered could be amortized over a 5-year period in lieu of the ordinary deduction for depreciation based on a longer time.

He also urged that the Bureau of Internal Revenue be required to allow accelerated depreciation during the war years and reconsider income tax returns for that sole purpose.

He also urged a national policy of liberalized depreciation be established in the interest of hastening the modernization of the nation's manufacturing facilities and increasing the productivity of labor.

May Output of Ingots, Castings in Canada Down

Toronto

• • • **Production of** steel ingots and castings in Canada during May fell below the totals of the previous month and for May 1946. For May output of steel ingots and castings amounted to 244,076 net tons, or an average of 82.5 pct of total rated capacity, as against 252,156 tons produced in April when the rate was 85.3 pct, and compares with 259,626 tons produced in May 1946. The month's output included 235,978 tons of steel ingots and 8098 tons of steel castings.

Following are comparative monthly production totals for 1947 in net tons:

	Steel Ingots	Steel Castings
January	243,557	6,241
February	223,124	6,098
March	263,193	6,539
April	244,998	7,158
May	235,978	8,098
Total	1,210,850	34,134

Empire Steel Earnings Up

Mansfield, Ohio

• • • **Empire Steel Corp.** recently reported record earnings for the first half of 1947 and "the strongest financial position in its history" with a net working capital position of more than $2,500,000.

Net profit for the first 6 months of this year amounted to $645,115, equal to $5.47 per share on 117,919 shares of common stock outstanding, compared with earnings of $4.26 per share on the same number of shares outstanding for the entire year 1946. Net sales for the first 6 months of this year amounted to $9,055,688. For the second quarter of this year Empire showed net profit of $399,991 and sales of $5,176,946.

Weekly Gallup Polls

(CONTINUED FROM PAGE 109)

The Democratic party today draws its voting strength mainly from farmers, manual workers, big city voters and young people —the same groups (except the farmers) which kept reelecting President Roosevelt.

The problem facing Mr. Truman in 1948 is whether he can hold those groups in line for himself as Mr. Roosevelt did, or whether they will find the Republican candidate, and GOP ideas more attractive.

It is still more than a year to presidential voting day, and hence no forecast of how Truman and the Democrats will make out is even remotely possible. The personality of the man picked by the Republicans to run against him, the economic situation at home and the course of our foreign policy will all weigh in the balance as voters go to the polls.

But at this early date it is interesting to compare the strength of the Democratic party by groups with past performance at election time in 1944 and 1940. This shows, among other things, the gains that have been made since 1944 among farmers.

	Democratic 1940 election Pct	1944 election Pct	Today Pct
Bus. & Prof.	36	42	43
White Collar	48	51	52
Farmers	54	48	58
Manual workers	65	62	61

The trend by size of community for the nonfarm population shows a fairly stable picture:

	Democratic 1940 Pct	1944 Pct	Today Pct
Towns under 10,000	52	49	53
Cities 10,000-500,000	54	54	52
Cities over 500,000	61	61	63

• • • **One year ahead** of the nominating conventions, Republican voters expressing a choice of presidential candidate name Gov. Thomas E. Dewey, Harold E. Stassen, Sen. Robert A. Taft and Sen. Arthur H. Vandenberg as their top favorites.

Virtually no change in the standings of these four has occurred since April.

Governor Dewey who remained silent during the political crisis

ONE ALWAYS STANDS OUT!

In the field of metal cleaners,
Wyandotte Porenac is an unequaled performer.

Prepared especially for the removal of drawing lubricants prior to pickling in porcelain enamel plants, Wyandotte Porenac emulsifies the toughest mineral oil compound with speed, economy and certainty.

The superior action of this balanced formulation eliminates the necessity for pre-cleaning, and thus greatly reduces over-all cleaning time. Its concentration requirements are low—its life in solution remarkably long.

Important, too, are the free rinsing qualities of Wyandotte Porenac, which prevent contamination of solutions in subsequent operations.

Wyandotte Porenac is of such versatility that it probably can be adapted to *your* specific problem, whether it be cleaning prior to porcelain enameling, barrel-plating, oxide finishing or other heavy-duty cleaning operations.

Your Wyandotte Representative will gladly tell you more about this and other Wyandotte Metal Cleaners. A call will bring **him.**

Wyandotte
REG. U. S. PAT. OFF.

SERVICE REPRESENTATIVES IN 88 CITIES

WYANDOTTE CHEMICALS CORPORATION • Wyandotte, Michigan

engendered by the Taft-Hartley bill, retains a comfortable lead in popularity at the moment. The governor is at present on a non-political tour which has taken him into the Southwest and Mountain States.

Candidate popularity is tested periodically by the institute on the question:

"What man would you like to see elected President of the country in 1948?"

Republican voters naming a choice today divide as follows, as compared to a similar poll in April. Only one in five (23 pct) expressed no choice.

	April Pct	Today Pct
Dewey	51	50
Stassen	15	15
Taft	7	9
Vandenberg	10	9
Warren	3	4
Eisenhower	4	4
Bricker	6	3
MacArthur	2	3
Saltonstall	1	*
Others	1	3

The fact that a man is popular 1 year before nominations does not in any sense mean that he will necessarily be picked by the convention delegates as the standard bearer.

In 1940, for example, right up to a few weeks before nomination time, Dewey was found leading by a substantial margin in the institute's poll of Republican voters. He had been leading in popularity for more than a year.

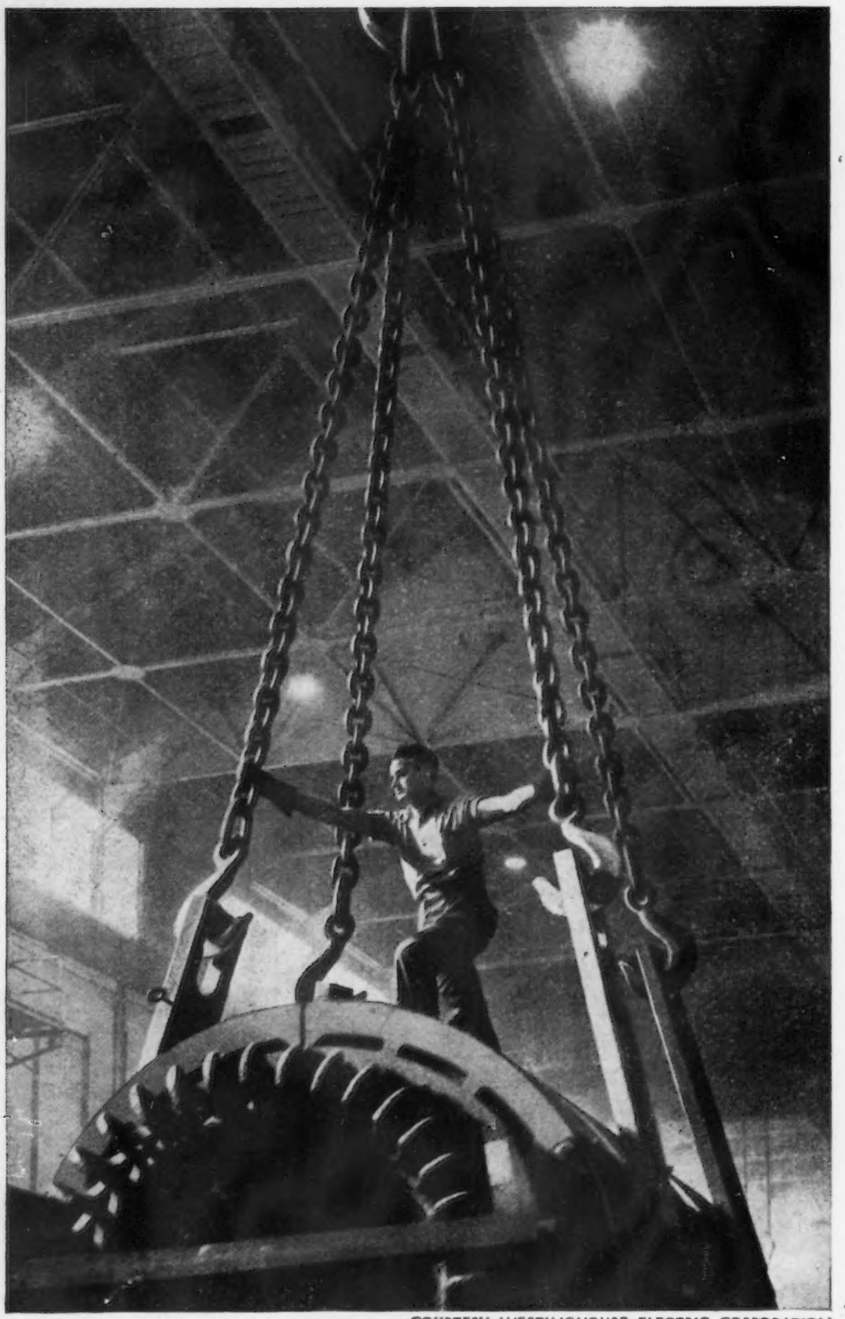
But Wendell Willkie, in a meteoric preconvention popularity rise, finally overtook him as the leading choice of the rank and file and got the nomination.

On the other hand, in 1944 Dewey was the popular choice a year or more before the convention; he held his lead, and was nominated.

A man's popularity is subject to wide changes from year to year. In 1945, for instance, Governor Dewey was far ahead as the candidate choice of his fellow Republican voters. During 1946, however, he slumped sharply, while Mr. Stassen's popularity rose.

At one point, in May, 1946, the two were running neck and neck.

Then, after Governor Dewey's reelection as governor of New York by a smashing majority in November 1946, he pulled out ahead of Stassen and has remained there ever since.



COURTESY WESTINGHOUSE ELECTRIC CORPORATION

American Chain at Work

Wherever things are made, chain plays an important part—in production, or in the product itself. Your AMERICAN CHAIN distributor is a responsible source, not only for Endweldur Sling Chains but for all types of welded and weldless wire and flat metal chain—a complete line of chain fittings, attachments and assemblies—repair links—cotter pins.

ACCO

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

4 years to build
6 HOURS FOR THE FURNACES

Scrap requirements are so huge that the furnaces of America could gobble up the scrap from the world's largest battleship in but six hours.

This is an example of the quantities of scrap required to keep steel manufacture at a high level.

Do your part by collecting and shipping scrap now!

CONSULT OUR NEAREST OFFICE FOR THE SALE OF YOUR SCRAP.

LURIA BROTHERS & COMPANY, INC.

Main Office

LINCOLN-LIBERTY BLDG.
PHILADELPHIA 7, PENNSYLVANIA

Yards

LEBANON, PA. • READING, PA. • PITTSBURGH, PA.
MODENA, PA. • DETROIT (ECORSE), MICH.
TOLEDO, OHIO

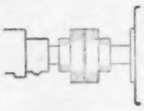
Branch Offices

Boston, Mass.–Statler Bldg. • **Cleveland, O.**–2201 Terminal Tower • **Houston, Texas**–Cotton Exchange Bldg. • **Lebanon, Pa.**–Luria Bldg. • **Chicago, Ill.**–100 W. Monroe St. • **Reading, Pa.**–Luria Bldg. • **New York, N. Y.**–Woolworth Bldg. • **Pittsburgh, Pa.**–Oliver Bldg. • **Detroit, Mich.**–2011 Book Bldg. **Pueblo, Colo.**–P. O. Box #1596 • **St. Louis, Mo.**–2110 Railway Exchange Bldg. • **Birmingham, Ala.**–Empire Bldg. • **Buffalo, N. Y.**–Genesee Bldg.

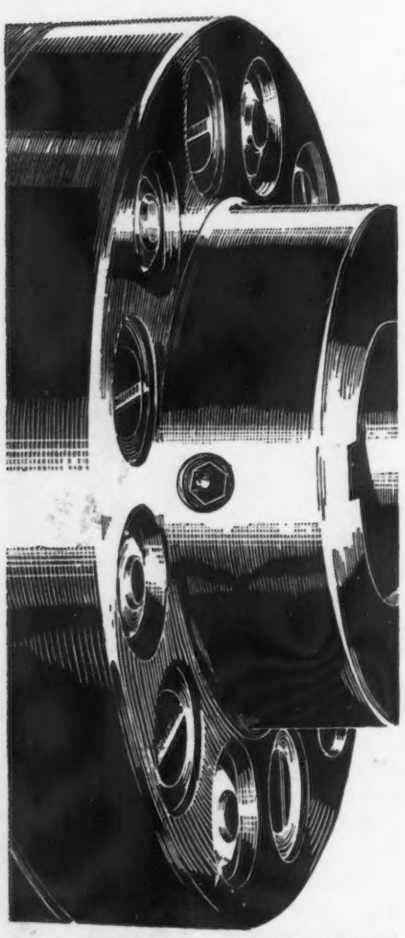
LEADERS IN IRON AND STEEL SCRAP SINCE 1889

AJAX

FLEXIBLE COUPLINGS



● The fact that *all the horsepower* goes *through the coupling* emphasizes the *importance* of protecting direct-connected machines against misalignment. Write for the Ajax Coupling data book or phone the Ajax man in your territory.



AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, NEW YORK

Fatigue Cracks

BY C. T. POST

Lovely Weekend

• • Even in the days before a salesman became a hero, some far-sighted firms drew the receptionist's fangs, had her present nonplussed drummers with personnel lists and a map showing the wash room. But our Chicago harrier, Stan Smith, was a little bowled over last week at a Milwaukee firm's welcoming leaflet. After putting out the welcome mat, it coos that ". . . as our guest, don't hesitate to ask for assistance in arranging for local transportation, travel reservations, hotel accommodations, and telephone and telegraph service, should you so require."

One of these days some orgiastic visitor is going to woo right back at the honey-haired keeper of the gates, "Wire the wife that I won't be home till Monday, reserve a double with bath at French Lick, get a drawing room on the Monon, call a cab, put on your hat and coat and let's get going."

Did We Say That?

• • Reader Joseph D. Heitger, M.D., of Louisville wants to know if we can find him a 1934 IRON AGE article which he swears stated that "in August, 1933, we were a little over 60 pct out of the depression, and if the different administrations had not been brought into the picture we probably would have been out within a year or two."

After fighting the War Among the States for all these years, it looks like wash room discussion in the land of juleps is jolting ahead 70 years or so.

Hello Bill!

• • George Sullivan, chief intelligence man on the Newsfront page, never having encountered an Eagles' Aerie, is worried over the aptronymity of associations:

"I can understand why book publishers might choose to call their local district groups 'chapters'," he concedes. "And structural steel men might label them 'sections'. The Controllers Institute of America is even justified in calling its local branches 'controls'. But this could get serious. One of these days we'll be getting a report from the foundrymen's society reading, 'Southern Ohio Cupola held a hot meeting here . . . Sandy Cast, chairman, poured and a good time. . . .'"

Our Own Classifieds

• • No slight intended to the classified section at the back of this issue, newspaper classified ads are a real commentary on the life in these United States. The Big City ads sound like someone being smothered by a pillow: "Bg. br., bth., bd., cvt. sbwy." That buggy bedroom makes us itch to even think of it. But out in the country just a little, people drop their inhibitions, bare their inmost hopes and sorrows, speak right up. From the Plainfield, N. J. *Courier-News*, we find, under "Situations Wanted—Women":

REFINED middle aged woman will care for modern home of gentleman for small salary, unusual opportunity, references. Write [redacted] Courier-News.

An ad like that might lead to all sorts of situations.

And in the Winnetka, Ill., *Talk*, there's just the lodging for the harried commuter accustomed to doing everything on the fly:

116 FOR RENT—ROOMS

LARGE, PLEASANT ROOM, LAVATORY near Winnetka Elm street stations, for a business gentleman. Available about June 28th. References req. Write [redacted], Box [redacted], Wilmette.

A couple of "Wanted To Rent—Apts." in the same sheet are an editorial in themselves on how veterans' rehabilitation is progressing:

VETERAN, ACCOUNTANT, AND WIFE desperately need small apartment. Have one dog and hope to have one or more children soon. Phone [redacted]

Or maybe a litter.

MARINE COUPLE SEEK FIRST APT. Ex-Marines, husband and wife; just first anniversary. Just had first baby; just first year out of service. Still looking for their first 3 or 4 room apt. or a garage apt. Please call [redacted]

Still that perfect timing—obviously.

Inflation

• • Your f.f.j.'s report last week on gray market charges and countercharges quotes "reports of tons of thousands or even thousands of tons of steel offered at high prices. . ."

Always go to bulk measure when the figures get too big.

For HEAVIER FEEDS at HIGHER SPEEDS

Always specify

CLE-FORGE HIGH SPEED **DRILLS**

TRADE MARK REG. U.S. PAT. OFF.

Drilling a single hole in a forged brake lever, as shown in the photo, is not a difficult operation. Yet even in this case, *cost per hole* has been the determining factor in selecting the proper drill for the job. ◈ On this basis you will find that CLE-FORGE High Speed Drills give you maximum results at minimum cost. Because these drills consistently take heavier feeds at higher speeds, they produce holes at lower cost.

Telephone your I S D INDUSTRIAL SUPPLY DISTRIBUTOR

The CLEVELAND TWIST DRILL COMPANY
1242 EAST 49th STREET
CLEVELAND 14

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

39 THOMAS ST., NEW YORK 7 • 9 NORTH JEFFERSON ST., CHICAGO 6 • 650 HOWARD ST., SAN FRANCISCO 4
2929 EAST GRAND BLVD., DETROIT 2 • 1902 NORTH FIELD ST., DALLAS 1
E. P. BARRUS, LTD., LONDON W. 2, ENGLAND

Every user of Udylite equipment and supplies knows that there is an experienced Udylite plating engineer always ready to help him correct plating difficulties and improve practice. Udylite has the know-how of plating experience with every type of installation.

Udylite also maintains a pilot plating plant in which a user's particular problem is solved without interfering with his regular production schedules.

These services, in combination with Udylite's ample stocks of platers' supplies, provide *plus* values which only an organization like Udylite can furnish

Udylite

THE UDYLITE CORPORATION

DETROIT 11, MICHIGAN

REPRESENTED IN PRINCIPAL CITIES

Dear Editor:

COMPOSITE STEEL PRICE

Sir:

We are often confronted with questions regarding the composite price of steel. To our knowledge your publication and *Steel* are the only published sources of such information. However, as you know, the two indexes are not comparable. Since we should like to be able to explain the respective composites and to differentiate between the two, we would greatly appreciate as detailed a description of them and of how they are constructed as you may be able to furnish us.

ROBERT N. WEIDENHAMMER
Chief, Machinery and Metals Section
Industry Div.
Dept. of Commerce
Washington

● The composite price index used in THE IRON AGE has two variables. Most others have only one. One variable is the base price of the steel products in the series. The other variable is the change in the percent of shipments of each item per latest quarter in relation to the total shipments of all products in the series. For instance, if the price of hot-rolled bars is advanced 20¢ a 100 lb and bar shipments were 15 pct of total shipments of all items in the series during the latest quarter the new price is multiplied by the percentage and the resultant factor is added to others to make up the weighted composite price. The shipment percent factors are revised as soon as final quarterly figures are in and the whole series is refigured. When the price changes, the series is also refigured. Our composite is then a weighted (to shipments) average of major finished steel products (all common items) and is not a simple arithmetical average of the base price.—Ed.

INDUCTION HEATING

Sir:

We would appreciate receiving two sets of tear sheets of the article entitled "A New Principle in Induction Heating" appearing on p. 46 of the June 12 issue.

MARION L. RAUSCH
Technical Information Dept.
Selas Corp. of America
Philadelphia

MAGNAFLUXING WELDS

Sir:

I noticed in the May 22 issue in Newsfront, an item regarding an electric eye to measure Magnaflux indications of welded pipe. This is very interesting and I wonder if you can tell me what company we could get in touch with to learn more of this device.

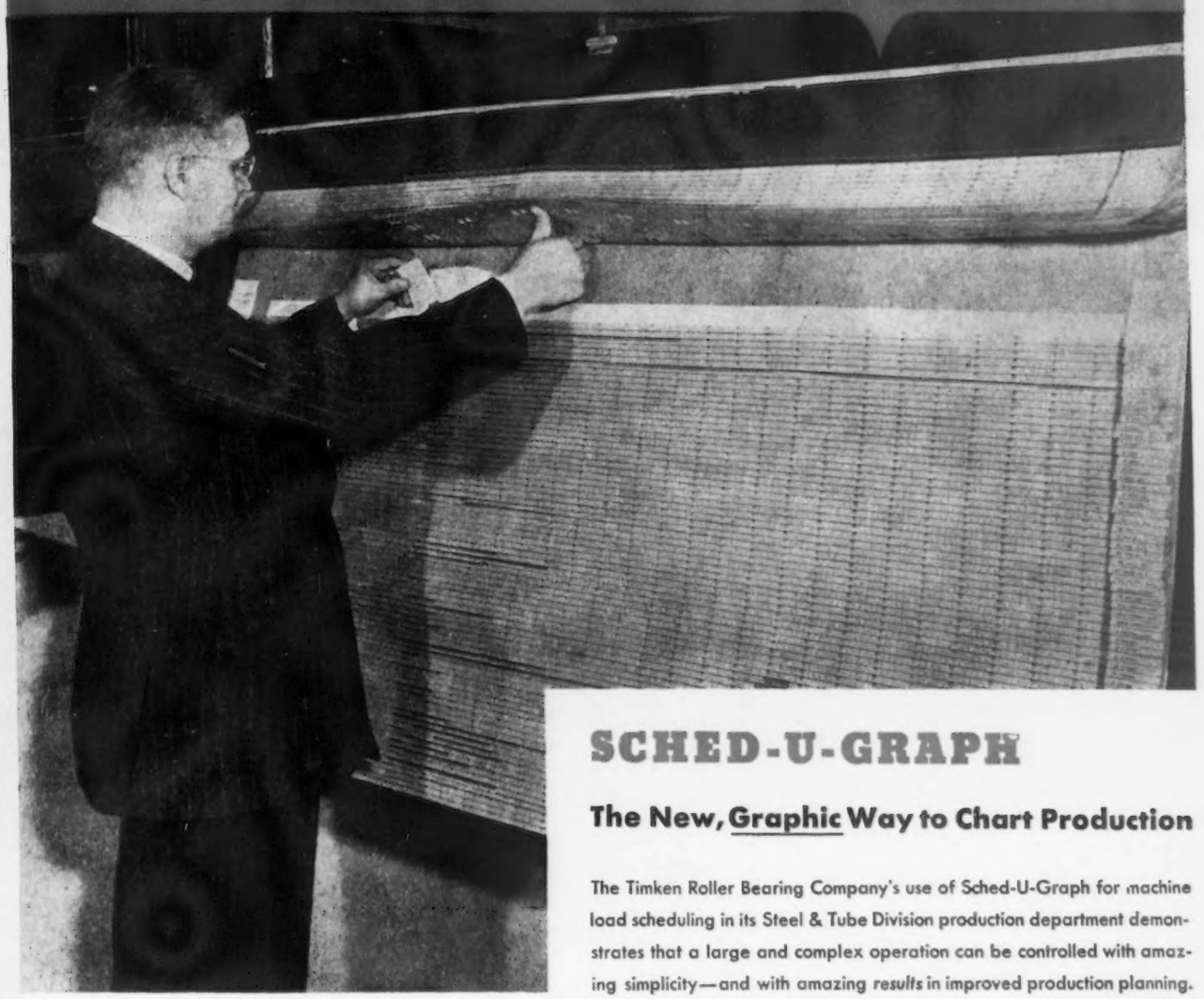
H. G. COFFEY
Aetna-Standard Engineering Co.
Youngstown

● Additional information can be obtained by writing to Mr. Glover, Magnaflux Corp., 5900 W. Northeast Highway, Chicago.—Ed.

(CONTINUED ON PAGE 28)

Here's how The **TIMKEN** Roller Bearing Company

Speeds Production Planning



SCHED-U-GRAPH

The New, Graphic Way to Chart Production

The Timken Roller Bearing Company's use of Sched-U-Graph for machine load scheduling in its Steel & Tube Division production department demonstrates that a large and complex operation can be controlled with amazing simplicity—and with amazing *results* in improved production planning.

Sched-U-Graph is an adaptation of the Kardex *Visible* record principle in enlarged size. As used by Timken, Sched-U-Graph provides a visible-edged pocket for each machine, representing thirty-one 24-hour days. Machine loading cards are inserted in the pocket to allocate time *graphically* to specific operations on individual orders. It's impossible to schedule two or more jobs simultaneously on the same machine. Moreover, it's easy to see where and when machine time for any particular job will be available.

For interesting details on how Sched-U-Graph works and how readily it can be adapted to your plant operation, call our nearest office, or write Remington Rand Inc., Systems Division, 315 Fourth Ave., New York 10, N.Y.

"10 MAJOR BENEFITS FROM SCHED-U-GRAPH"

Condensed from an article by Mr. James S. Freese, Production Dept, Timken Roller Bearing Company

James S. Freese

1 Large increase in orders shipped complete and on time.

2 Customer delivery inquiries reduced.

3 Fewer tool and set-up changes.

4 Loss of material eliminated.

5 Scrap loss and waste reduced.

6 Clerks released for productive work through elimination of needless duplications of posting in the Cost and Production departments.

7 Record-keeping simplified in operating departments, permitting release of certain clerks to the Production Department. This results in . . .

8 A stronger scheduling section.

9 Easier determination of advance work schedules for operating departments.

10 Benefits to Sales Department through improved customer service.

Remington Rand

THE FIRST NAME IN BUSINESS SYSTEMS

BOOTH 125
MACHINE TOOL SHOW
SEE HOW

UNION CHUCKS

CUT PRODUCTION COSTS

At the Chicago Machine Tool Show be sure to see what's new in *the broadest line of chucks in the world* — Union chucks.

See, for instance, how Union indexing chucks cut labor, machine time and fixture costs by eliminating multiple handling and chucking of work with more than one face to be machined.

Investigate the advantages to you of Union power operated chucks—electrical, air and hydraulic. See how fingertip control of a greater range of jaw pressures will give you faster production with less man-time, down-time and operator fatigue.

The Union Manufacturing Company has been serving industry for 70 years. In chuck design and manufacture, Union has continually kept ahead of industry's needs, opening the way to greater productivity of men and machines. This engineering leadership, as well as Union's widely recognized integrity of workmanship, are reflected in the complete line of chucks described and illustrated in Catalog No. 62. Distributors in all important industrial centers.

Chucks - Hoists - Trolleys

UNION MANUFACTURING COMPANY

298 Church Street, New Britain, Conn.

Dear Editor:

ALUMINUM BRONZES

Sir:

The Newsfront item in the June 19 issue, on "high temperature aluminum bronzes are among the materials being ordered for rocket motor research" is quite interesting. Is there any further information available as to the particular alloys required for this application?

W. B. SCOTT
Engineering Dept.

Aurora Metal Co.
Aurora, Ill.

● All we knew was that high temperature aluminum bronzes were being ordered for "Hermes Project." At the time, about six months ago, no one knew what "Hermes Project" was. Subsequently it has been revealed as a rocket motor project. But that is all to date.—Ed.

VACUUM STEEL CASTING

Sir:

In the June 12 issue in Newsfront on p. 45 you mention that a vacuum steel casting process has been developed which gives complete mechanical control of the casting operation. Can you please furnish me with more information on this process, or references where I can obtain the desired information?

F. P. STRIETER
Assistant Director
Process Development Div.

Magnesium Div.
Dow Chemical Co.
Midland, Mich.

● The process is a joint development of Armour Institute and Wetherill Engineering Co., Philadelphia. Mr. K. V. Wheeler, 57 Sunnywood Drive, Westfield, N. J. can give you further information on the subject.—Ed.

WASTE PICKLE LIQUOR

Sir:

I am interested in obtaining three copies of an article from the July 3 issue, entitled "Analysis of Waste Pickle Liquor" by R. D. Hoak.

A. B. WILDER
Chief Metallurgist

National Tube Co.
Pittsburgh

NEW ADDRESS

Sir:

Can you advise us of the present address of Majestic Drill Sharpener Co., formerly at 1224 Harmon Place, Minneapolis 3. We have handled this drill and our last correspondence was returned to us by postal authorities marked "Moved."

C. A. BASHFORD
Vice President

Knight & Wall Co.
Tampa, Fla.

● The Majestic drill sharpener is made by Ameraco Industrial Specialties Co. 120 S. Michigan Ave., Chicago.—Ed.

FUTURE SALES OF MACHINE TOOLS AND ALLIED PRODUCTS TO BE AFFECTED BY NEW PATTERN FOR BUYING

NEW YORK — Any company manufacturing machine tools, or products used in connection with them, cannot afford to ignore a new pattern of influences bound to affect the future buying of such equipment. These influences will stem from a "première" of the greatest developments ever made in the machine age — the National Machine Tool Show at the Chicago-Dodge Plant this fall.

In the years immediately ahead, buyers of machine tools and allied products will look for factors of greater productivity all along the line. Their new ideas of what they want will come from what they learn in connection with this great industrial show. When making purchases in the future they will recall, refer to and consider the products of those progressive companies who, at the time of the show, publicized their new products, their advancements and better services.

In the interest of future sales, how can any manufacturer afford not to be a part of this great Machine Tool Show?

How to make sure

You're Right In There

Exhibitors at the National Machine Tool Show are featuring their new developments in the special show issue of The Iron Age, the world's leading metalworking publication. Why? Because in this issue The Iron Age will feature unprecedented editorial material on the show itself and on the economics of the machine. All of which will create a readership of well over 100,000 industrialists who influence nearly 100% of the world's buying power for tools, machines and allied products.

NEXT BEST TO EXHIBITING AT THE MACHINE TOOL SHOW

is to advertise in the show issue of The Iron Age. Reserve space now in the special show issue of The Iron Age, September 11, 1947. Call, write, wire or teletype The Iron Age now. Regular advertising rates apply.

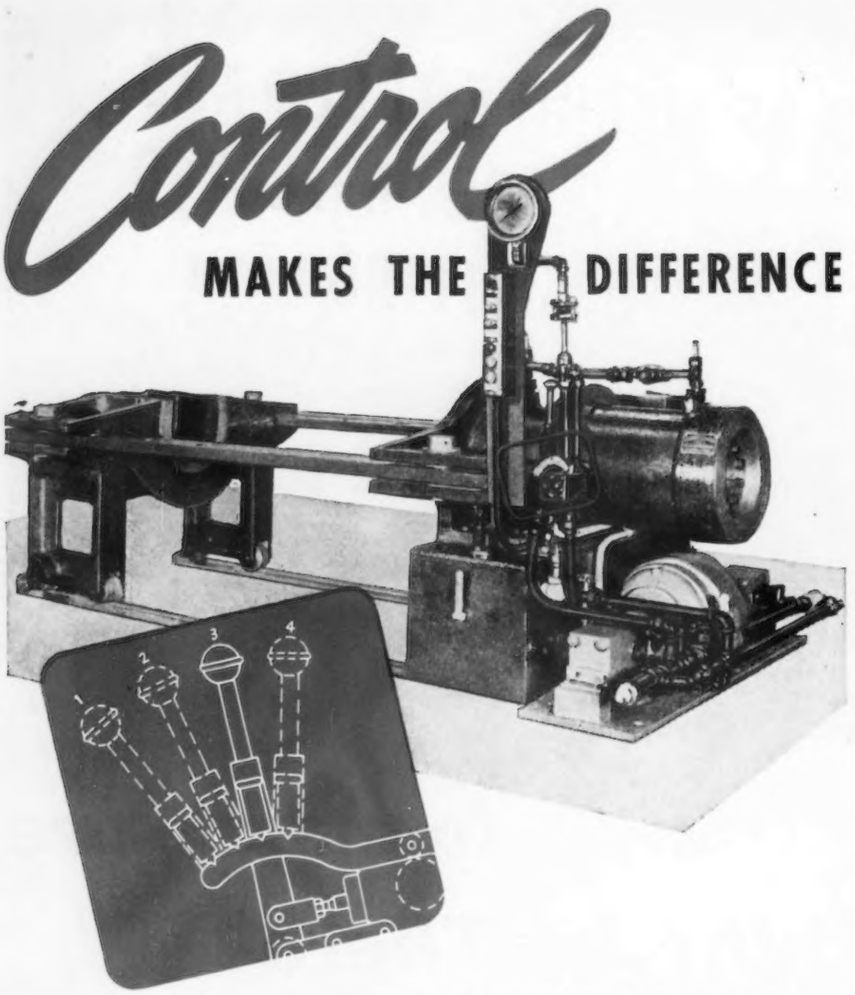
The Iron Age
100 E. 42d St.
New York 17, N.Y.

The IRON AGE

A CHILTON PUBLICATION

ABP ABC

Control MAKES THE DIFFERENCE



THIS *all-purpose* R. D. Wood HYDROLECTRIC Horizontal Forcing Press for general machine shop and maintenance service is the ideal press for assembly and disassembly of heavy machinery components. And here's why: *Control makes the difference* . . . control of operation by means of the special lever-operated control valve which permits:

1. *Main cylinder on pressure. Pullback cylinder on pressure. High speed forward—*
   12.7 tons at 400 psi—57"/min.
   56 tons at 1,770 psi—12.7"/min.
2. *Main cylinder on pressure. Pullback cylinder on exhaust. Slow speed forward—*
   22.6 tons at 400 psi—32"/min.
   100 tons at 1,770 psi—7.2"/min.
3. *Neutral—pumps by-passing to oil reservoir.*
4. *Main cylinder on exhaust. Pullback cylinder on pressure. High speed return stroke—72.5"/min.*

This press in other designs, various sizes and capacities is available to meet a complete range of manufacturing and maintenance requirements. Send today for more detailed specifications or engineering advice. R. D. Wood Company, Public Ledger Bldg., Independence Square, Philadelphia 5, Pa.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

R.D. Wood Company
EST. 1803

Dear Editor:

PLATING CONVEYERS

Sir:

Would you kindly send tear sheets of the article entitled "Automatic Conveyers for Electroplating" by Adolph Bregman which appeared in the June 19 and 26 issues.

D. C. LESLIE
Bullard Co.
Bridgeport

NONFERROUS SCRAP PRICES

Sir:

We are experiencing considerable pricing difficulty at the present time due to unsettled conditions in the trade. We are receiving constant requests for confirmation of prices as listed in the trade papers and it is very embarrassing. You no doubt are aware of the fact that the smelters and mills are out of the market at present and are not placing any orders for futures or are they guaranteeing any prices. Taking this into consideration we feel it would be much better for every one concerned if the prices were not published at present. Kindly give this your consideration and advise your comments.

C. A. BAXTER
Kopelove Iron & Metal Co.
Dayton

● We believe you have reference to nonferrous metal scrap prices. Recently we have reported in the nonferrous metals news and markets page that there has been no buying on the part of mills and smelters and have indicated that the prices quoted were purely nominal. However, we have indicated a price drop in copper, as well as declines in aluminum and nickel alloy scrap. It will be noted that our prices are dealers' buying prices at New York. We regret that we are unable to omit our price quotations even during periods of no buying by consumers. At these times our prices are needed by many factors for comparative purposes.
—Ed.

SEAMLESS TUBE PRODUCTION

Sir:

We are interested in receiving reprints of the article, "Gas Heating Speeds Seamless Tube Production," which appeared in the June 5 issue, p. 64.

R. E. BUCKHOLDT
Salem Engineering Co.
Salem, Ohio

HIGH TEMPERATURE ALLOYS

Sir:

I would appreciate it if you would send me a copy of "Characteristics of Three High Temperature Alloys" from the June 12 issue.

A. A. BRADD
Ass't Supt. of Research
Midvale Co.
Philadelphia

Swords of war into tools of peace

From far off Pearl Harbor—across 6000 miles of land and ocean CALUMET carried mountains of scrap to feed the forges of peacetime America—and this project was manned throughout by CALUMET'S own personnel.

This service is typical of CALUMET'S facilities for handling a man-sized job. But, large or small, near or far—CALUMET has the men, the machines and the on-the-job experience to handle your scrap problems quickly and well.

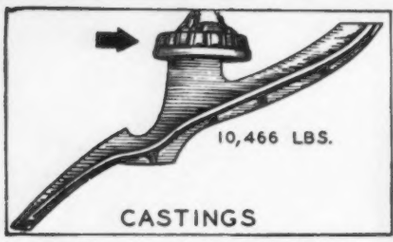
We will be glad to cooperate with your local contact. For a square deal, a fair deal—call CALUMET!

CALISCO
SINCE 1926

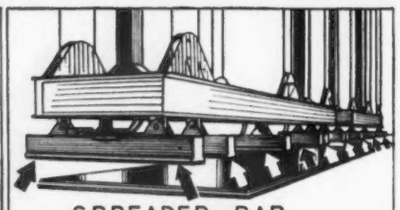
CALUMET
IRON & SUPPLY CO.

East Chicago, Ind.—Cable Address: CALISCO

scrap iron and steel • structural steel • plates • sheets • pipe-tubing • steel erectors and dismantlers • steel fabrication • railroad materials



CASTINGS


SPREADER BAR

Lifting Magnets FOR ALL PURPOSES

You get definite saving of time and labor in moving material inside and outside of your plant with Stearns Lifting Magnets.

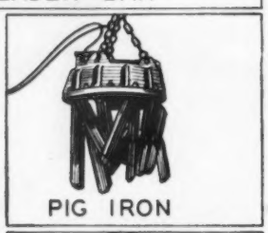
Will speed your loading and unloading operations—obviate hand labor on dangerous and difficult jobs—increase storage capacities—reduce your costs.

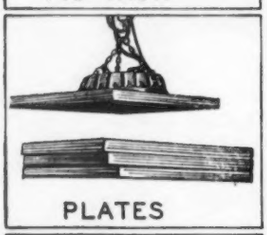
Stearns Magnets are being successfully and profitably used in handling scrap iron, loose or baled; steel plates, coils, bundles, strips; rails, slabs, billets, pig iron, castings, borings, turnings, finished products, etc., as well as for road and floor sweeping purposes. Can be installed on industrial crane trucks for out of the way spots not reached by overhead cranes.

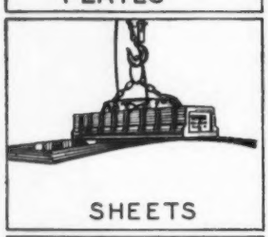
Stearns Magnets pay for themselves in a short time, require surprisingly little attention, are your best bet for economical, fast and safe moving of material.

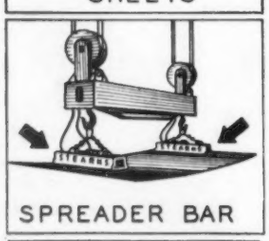
Let Stearns give you a lift with sturdy, dependable, low initial and operating cost magnets. Can be had in all practical sizes and shapes to suit your requirements.

And—we can furnish Suspended Separation Magnets also in sizes and shapes to do your work.

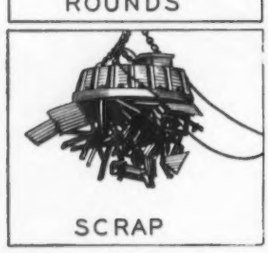

PIG IRON


PLATES


SHEETS


SPREADER BAR

ROUNDS


SCRAP

MAGNETIC SEPARATORS
DRUMS
CLUTCHES
BRAKES

Stearns

MAGNETIC MFG. CO.

635 So. 28th St.
MILWAUKEE 4, WIS.

Dear Editor:

STEEL FOR STOVES

Sir:

In the Industrial News Summary of June 16 the statement is made: "There is less pressure for delivery of steel from makers of stoves, refrigerators, kitchen cabinets and similar items." As you probably know, this institute has for many years represented the manufacturers of several types of stove products. We have found no indication of a slackening of demand for steel for stoves and, as a matter of fact, our members have been particularly insistent in their requests for help on steel deliveries within the past several weeks. In view of this fact, I am wondering if you would be good enough to tell me the source of your information that there is less pressure from stove manufacturers for steel delivery.

SAMUEL DUNCKEL
Managing Director
Institute of Cooking and Heating Appliance Manufacturers, Washington

● The report was based on two factors: (1) Manufacturers of almost all consumer products, and stoves are included, have been watching their inventories far more carefully in the past few weeks; (2) from reliable sources both in the steel industry and in the distribution line we learn that, apparently as a result of this inventory consciousness, pressure for delivery of steel has eased. This does not imply that stove makers are seeking substantially less steel but merely that a realistic look at their inventories has shown several of them the wisdom of keeping them in balance.—Ed.

KIRKSITE

Sir:

Could you kindly direct us to the proper source where we could purchase Kirksite metal. In your issue of Aug. 17, 1944 on pp. 75-77 under heading "Non-Ferrous Alloy Blanking Dies" you had mention of this material and we are desirous of obtaining it.

ROBERT T. DIEGES
Dieges & Clust
Providence

● Write to the Kirksite Div., National Lead Co., 111 Broadway, New York 6.—Ed.

URGENTLY NEEDED

Sir:

We are interested in purchasing chromium and cobalt, tungsten and nickel. I am wondering if you can refer us to a source of supply for a small purchaser. We will probably purchase under $50.00 worth at a time. We are in urgent need of this and will appreciate it if you will give us prompt consideration.

MYRON SIGLER
Myron's Dental Laboratory
Kansas City, Kan.

● Send full particulars concerning your needs to the firm whose name we are forwarding.—Ed.